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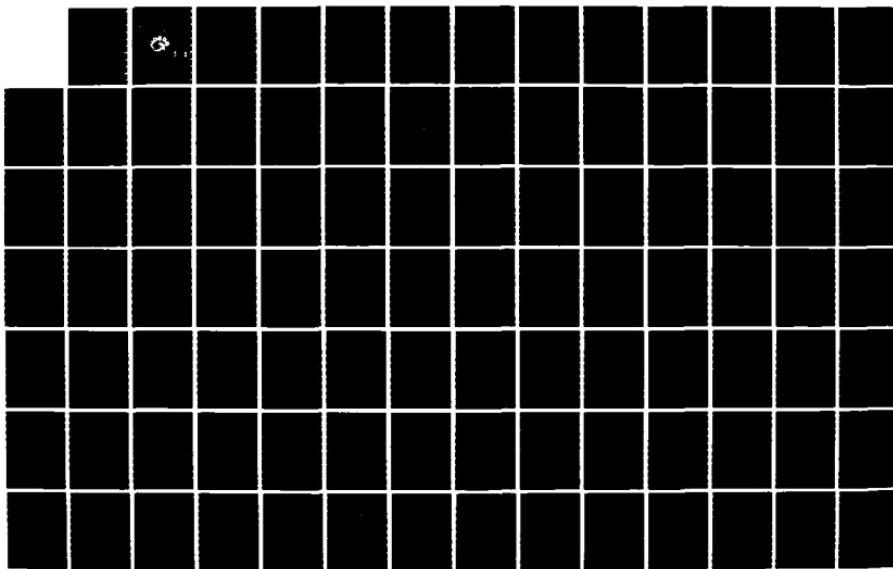
NAVY CORRECTED GEOSTROPHIC WIND SET FOR THE GULF OF
MEXICO(U) JAYCOR ALEXANDRIA VA R C RHODES ET AL.
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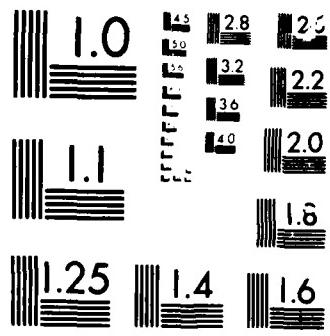
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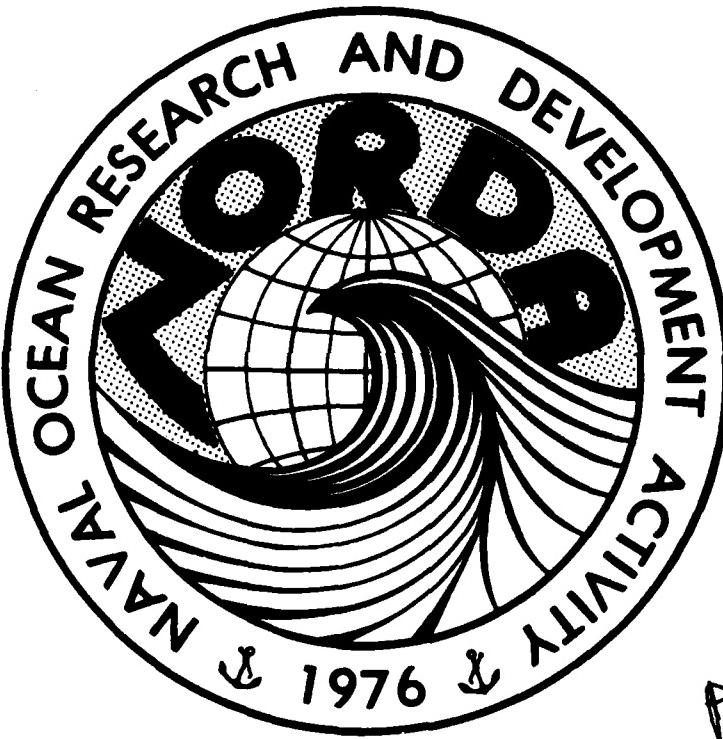
Naval Ocean Research and
Development Activity
NSTL, Mississippi 39529

Contract N00014-85-R-0578



Navy-Corrected Geostrophic Wind Set for the Gulf of Mexico

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March 1985

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ABSTRACT

The large variability of the Gulf of Mexico wind field indicates that high-resolution wind data will be required to represent the weather systems affecting ocean circulation. This report presents methods and results of the calculation of a corrected geostrophic wind data set with high temporal and spatial resolution.

Corrected geostrophic wind was calculated from surface pressure analyses compiled by the Fleet Numerical Oceanography Center. The correction factors for wind magnitude and direction were calculated using linear regressions of observed Gulf buoy winds and geostrophic winds derived at the buoys. The regressions were done for each month to determine the seasonal variability of the correction factors. The magnitude correction was found to be nearly constant (0.675) throughout the year, but the direction correction varied as a sine function dependent on the time of the year.

The corrected geostrophic wind was calculated twice daily from 1967-1982 on a spherical grid over the Gulf, and the wind stress and wind stress curl fields were then calculated. Twelve-hourly stress and curl fields show large temporal variations of the wind field for both winter and summer months. Seasonal and monthly climatologies of the stress and corresponding curl show positive curl over the Yucatan and negative curl in the southwest Gulf, which are features not seen in any previous study of Gulf wind stress.

ACKNOWLEDGMENTS

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CONTENTS

INTRODUCTION	1
DATA AND METHOD OF ANALYSIS	1
RESULTS	2
Ageostrophic Corrections	2
Wind Stress and Wind Stress Curl	2
REFERENCES	2
APPENDIX A: WIND STRESS AND WIND STRESS CURL FOR JANUARY 11-19 (days 011-019) AND JULY 11-19 (days 193-201), 1976	5
APPENDIX B: SEASONALLY AVERAGED WIND STRESS AND WIND STRESS CURL CLIMATOLOGIES FOR THE PERIOD 1967-1982	19
APPENDIX C: MONTHLY AVERAGED WIND STRESS AND WIND STRESS CURL CLIMATOLOGIES FOR THE PERIOD 1967-1982	25
APPENDIX D: MONTHLY AVERAGED WIND STRESS AND WIND STRESS CURL EACH YEAR FROM 1967-1982	41

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NAVY CORRECTED GEOSTROPHIC WIND SET FOR THE GULF OF MEXICO

INTRODUCTION

In their climatological analysis of frontal activity in the Gulf, DiMego, Bosart, and Endersen (1976) have shown that frontal frequency increases rapidly from September to October. A strong maximum exists in the winter months with the duration of frontal activity approximately 1 to 2 days. Activity decreases more gradually through the spring, and very little frontal activity occurs in the summer months. The frontal activity is associated with some of the highest wind speeds and stresses observed in the Gulf of Mexico. The large variability of the Gulf of Mexico wind field indicates that high-resolution wind data will be required both spatially and temporally to represent the weather systems affecting ocean circulation.

Previous data sets have lacked the needed resolution and, therefore, are far from ideal for use in studying the dynamics of Gulf circulation. The data sets of Franceschini (1953) and Elliott (1979) both are derived from historical ship observations. The Franceschini wind data are monthly averaged stress climatologies with 2° grid resolution, while the Elliott data are seasonally averaged stress climatologies with 1° grid resolution. The data set of Blaha and Sturges (1978), supplied by Bakun (1973), is monthly averaged values of wind stress derived from surface pressure data extending continuously over the period 1946-1975. In each case the temporal resolution is particularly poor, with highest resolution being monthly. Monthly or longer averages cannot possibly represent short-term wind variability, and it would be preferable to provide the ocean model with wind data supplied much more frequently.

DATA AND METHOD OF ANALYSIS

The most promising sources for frequent synoptic atmospheric data in the Gulf are the atmospheric forecasting centers. The approach taken here is to calculate corrected geostrophic winds from surface pressure analyses compiled by the weather services. The most desirable data set is the one used to initialize the National Weather Service's limited fine-mesh model because of its high resolution over the Gulf. Only a subset of the surface pressure analysis (that does not cover the entire Gulf) has been archived at the National Center for Atmospheric Research (NCAR). The best readily available data for use in calculating the geostrophic winds are surface pressure fields obtained from the Fleet Numerical Oceanographic Center's (FNOC) 12-hourly analysis, with approximately 280-300 km grid resolution over the Gulf. This data was obtained for all available time periods from 1967 to 1982.

The pressure was interpolated to a spherical grid over the Gulf, and the geostrophic wind was calculated at three buoys in the Gulf for direct comparison with the observed buoy wind. The buoys were located at (26.0°N , 90.0°W), (26.0°N , 93.5°W), and (26.0°N , 86.0°W), and the data were available at either 1-hourly or 3-hourly intervals from 1977 to 1982.

Ageostrophic corrections were calculated by directly comparing geostrophic wind and buoy wind by using linear regressions for both magnitude and direction. Blaha and Sturges used constant ageostrophic correction factors of 0.7 for speed and 15° for direction, but these figures were obtained from a study done by Bakun using data from the west coast of the United States. Since the correction factors depend on atmospheric stability, Bakun's correction factors are not necessarily appropriate

for the Gulf. Wind stresses were calculated on a spherical grid over the Gulf from the corrected geostrophic wind using constant atmospheric density and a constant drag coefficient equal to 0.0013. This calculation is identical to that used by Blaha and Sturges. The geostrophic winds, corrected geostrophic winds, and wind stresses (all on a 1° grid covering the Gulf) will be available on separate magnetic tapes from the Gulf of Mexico Regional Office of the Minerals Management Service.

RESULTS

Ageostrophic Corrections

The data from all available years and for the three buoys were combined by month, and linear regressions performed to determine seasonal variability. The results showed that the magnitude correction factor had little variability throughout the year, but the direction correction was a function of the month and was shown to have a large sinusoidal component. The angle correction was larger in the winter than in the summer. Therefore, one magnitude correction (0.675) was used for the entire year, while the direction correction varied according to:

$$C = 17.5 + 9 \sin 2\pi i/N \quad i = 1, N \quad (1)$$

where C is the correction factor in degrees, N = 730, the number of observations per year, and i = 0 on October 1st of each year. For simplicity, exactly the same formula is used in leap years, since the variation in C over 1 day is negligible.

Wind Stress and Wind Stress Curl

Appendix A shows wind stress and wind stress curl for two 9-day periods, January 11-19 and July 11-19, 1976, with two observations per day. There is a large temporal variability of the wind stress and wind stress curls during this period, indicating why the modeling of Gulf circulation requires wind data on short temporal scales.

Appendix B shows seasonal climatologies averaged over the period 1967-1982, and Appendix C shows monthly climatologies over the same period. The wind stress and wind stress curls are much stronger in the winter than the summer as would be expected. There are persistent areas of positive curl over the Yucatan and negative curl in the southwest Gulf for both seasonal and monthly climatologies, which are not seen in any previous study of Gulf wind stresses. Appendix D shows the monthly averaged wind stresses and wind stress curls for each year from 1967 to 1982.

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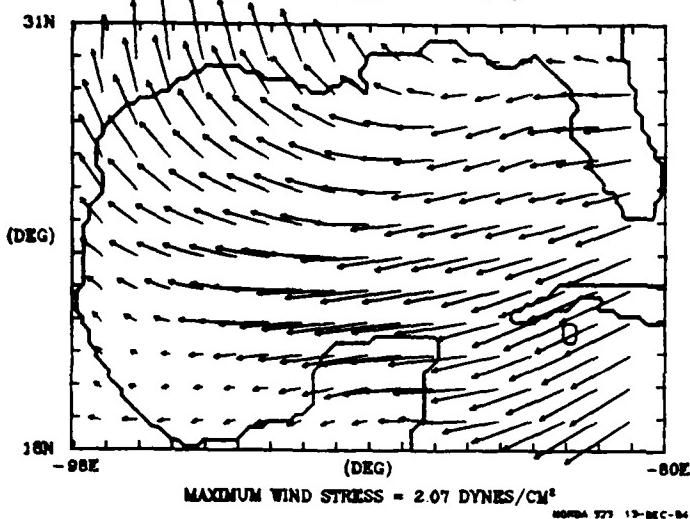
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APPENDIX A: WIND STRESS AND WIND STRESS CURL FOR JANUARY 11-19 (days 011-019)
AND JULY 11-19 (days 193-201), 1976

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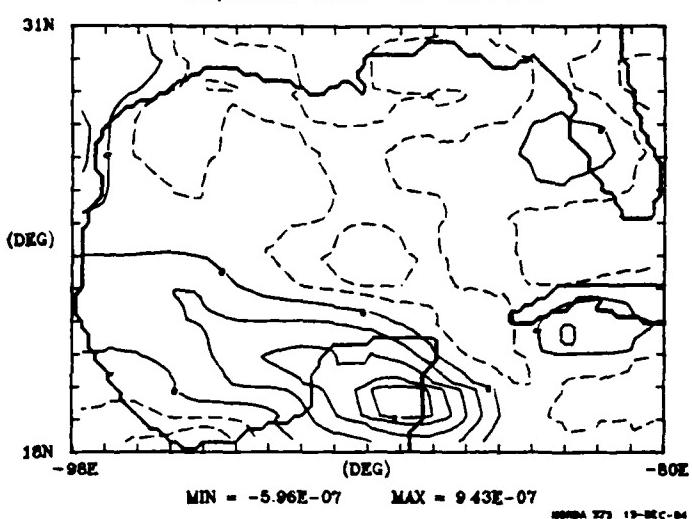
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WIND STRESS CURL

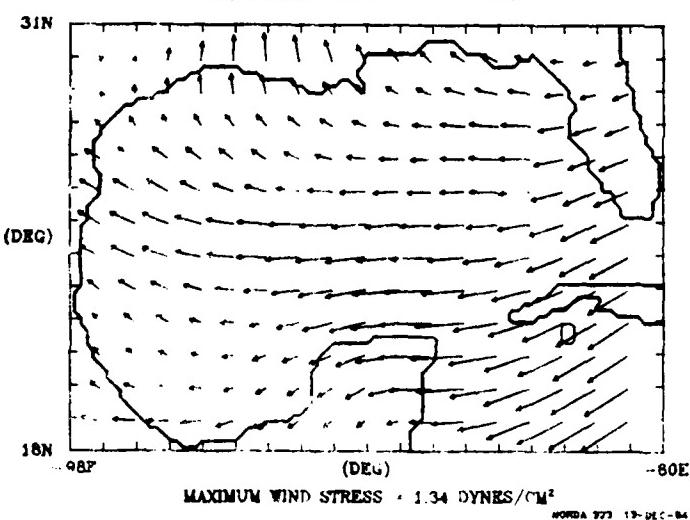
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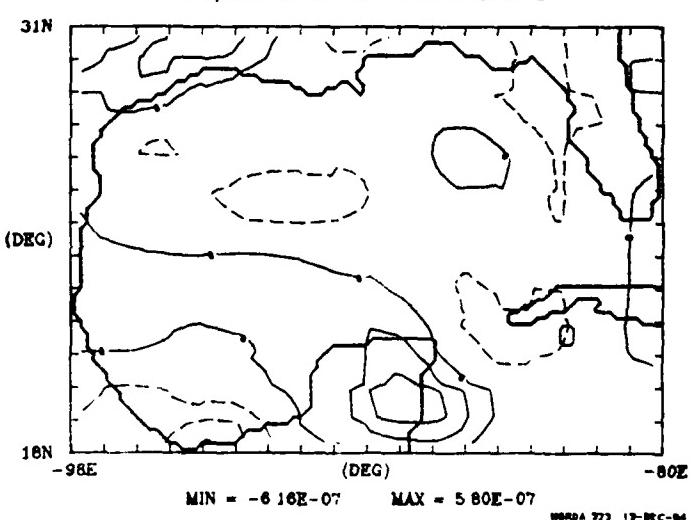
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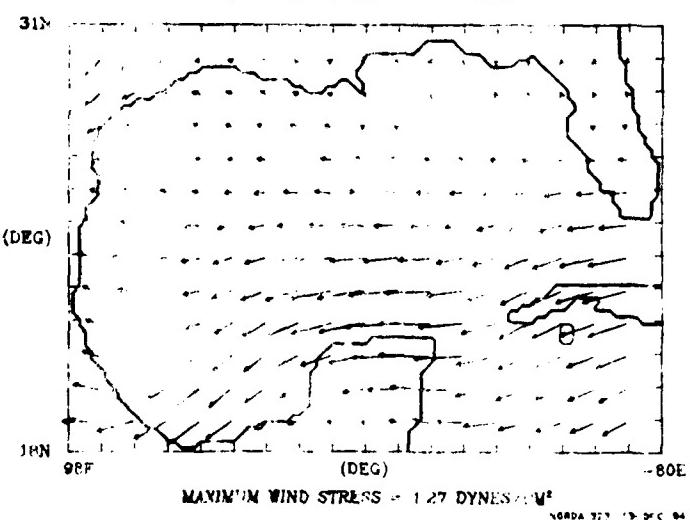
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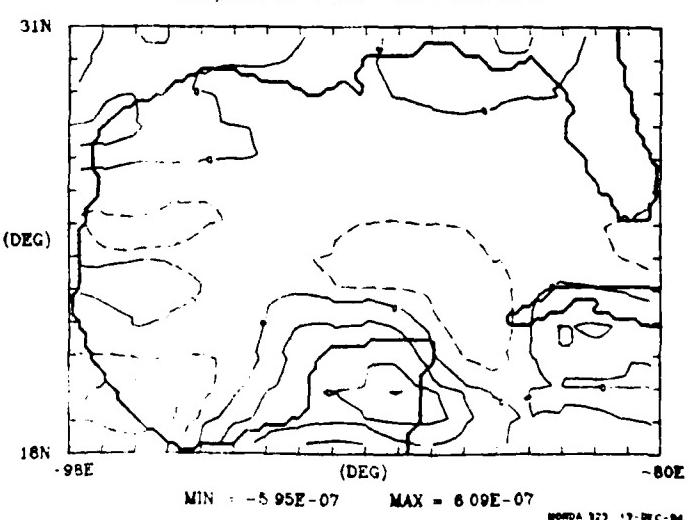
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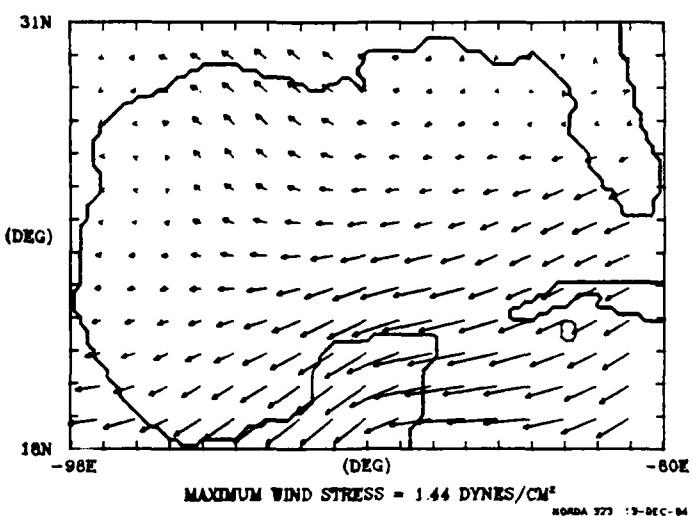


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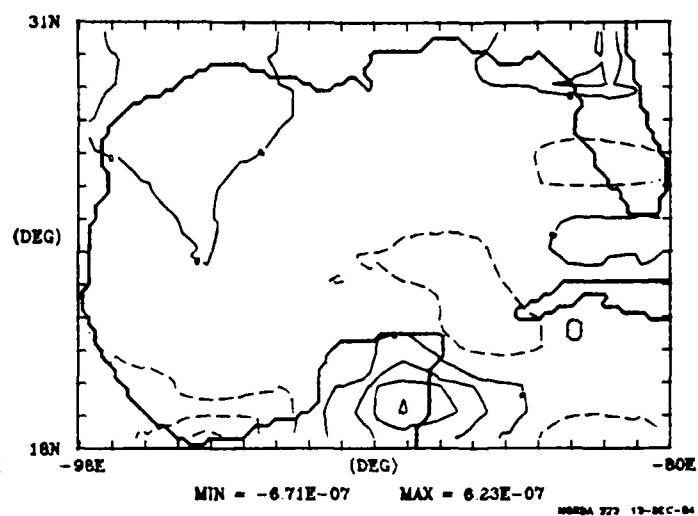
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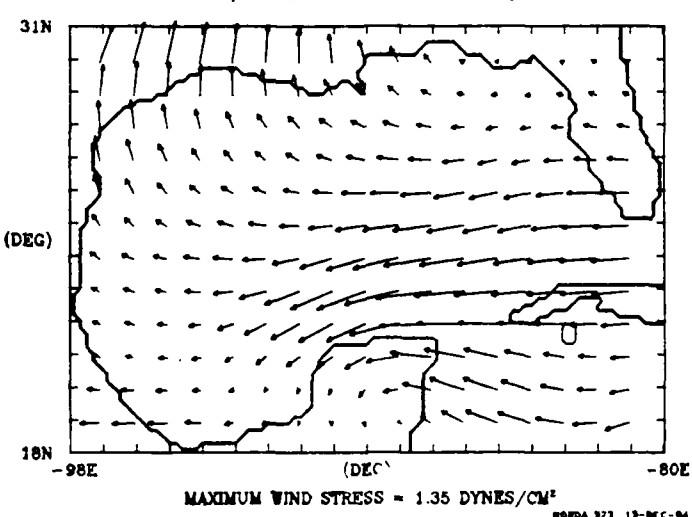
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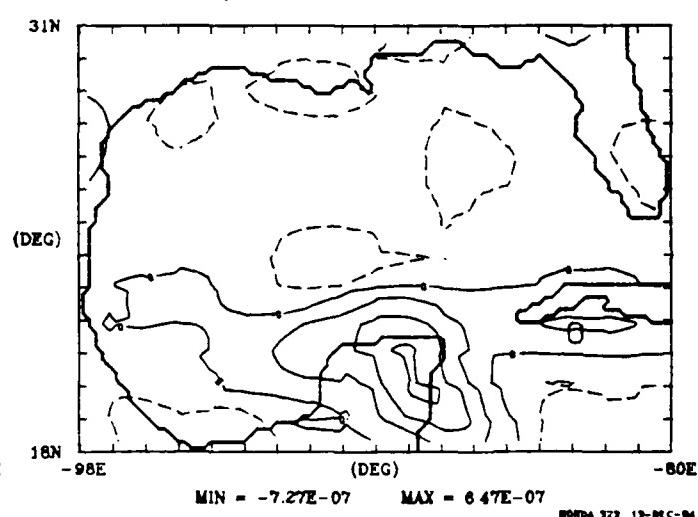
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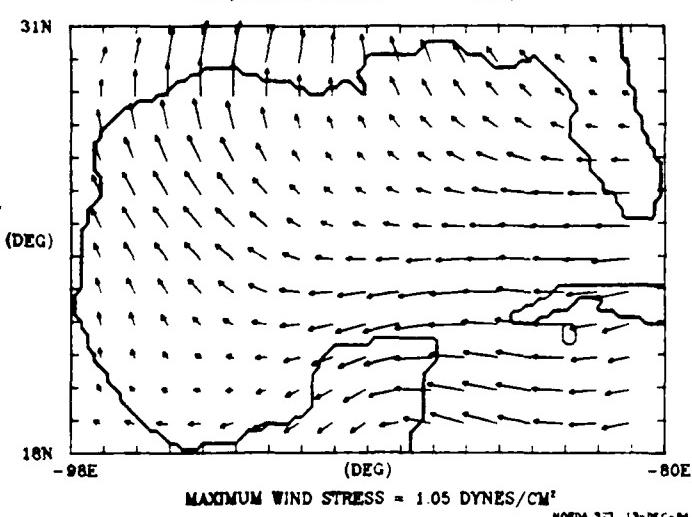
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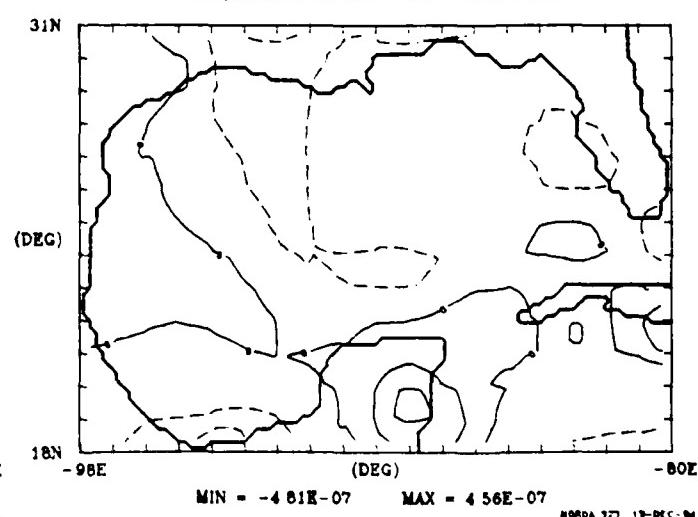
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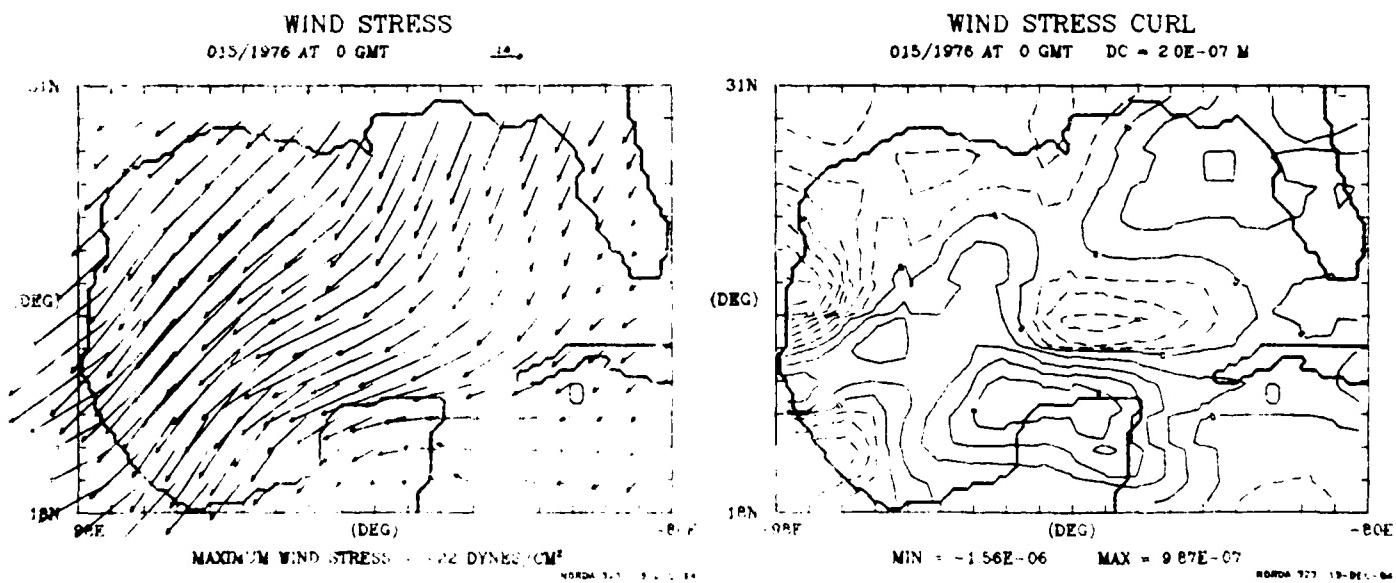
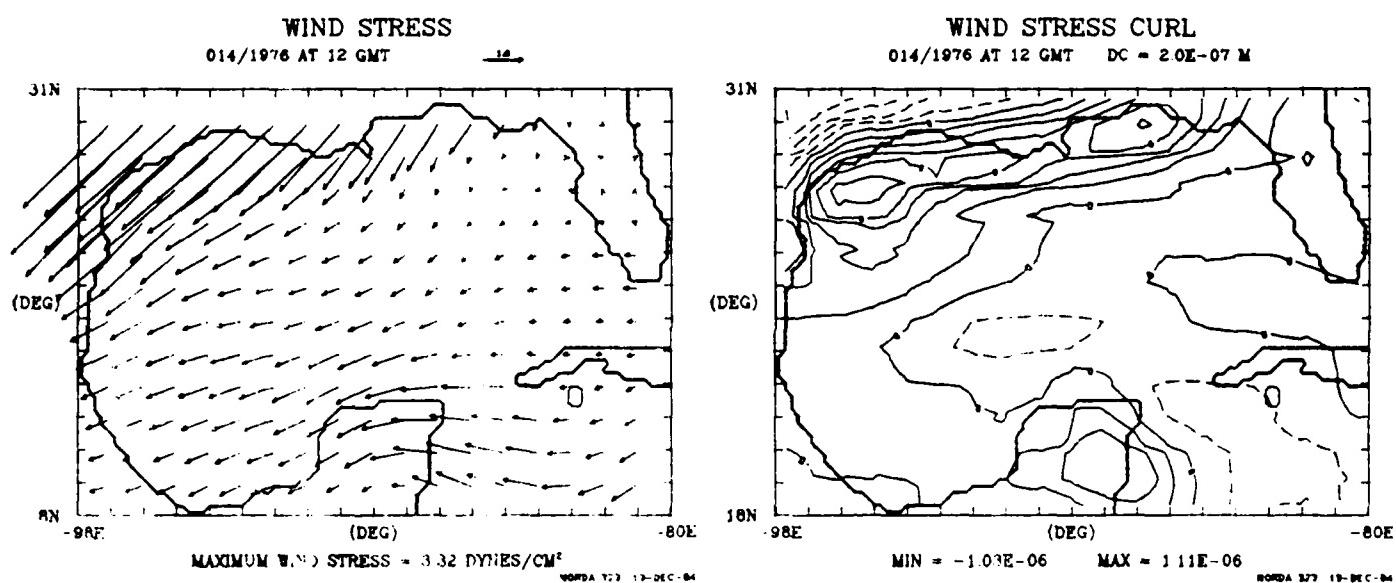
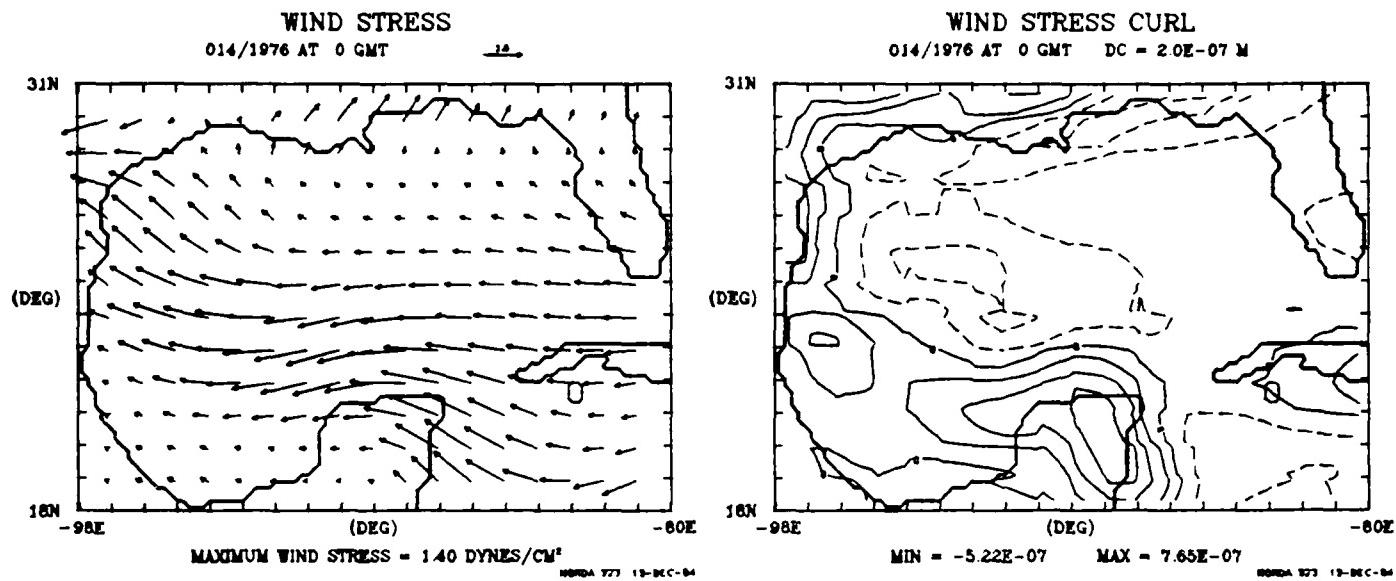


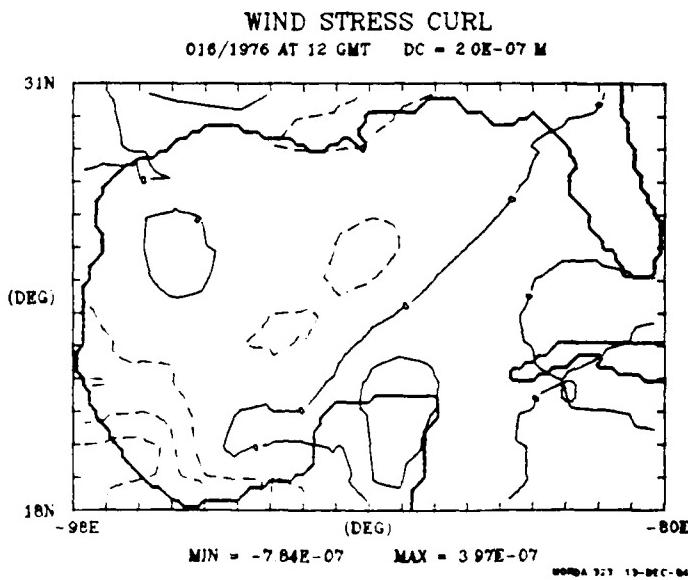
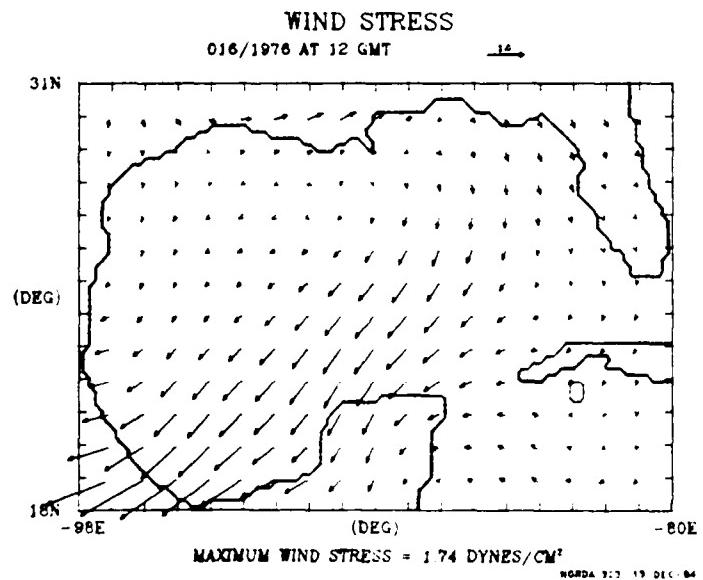
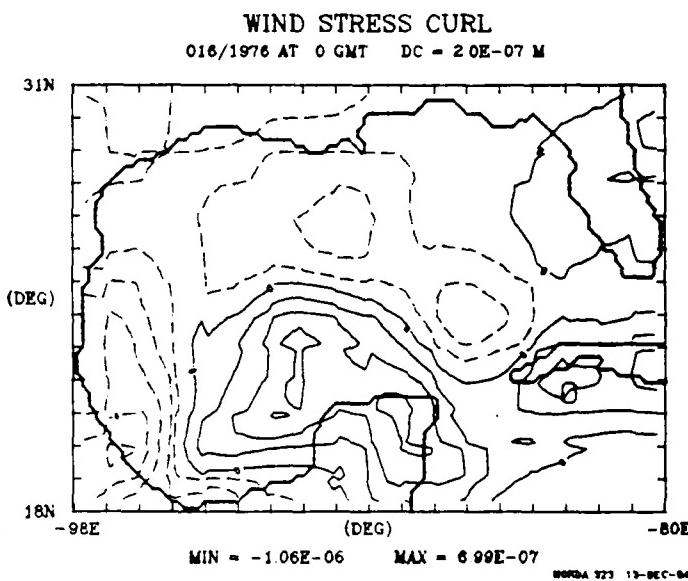
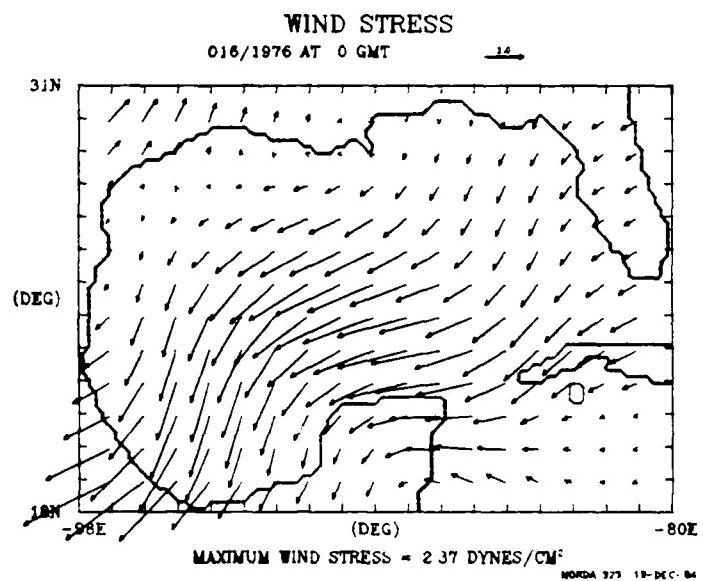
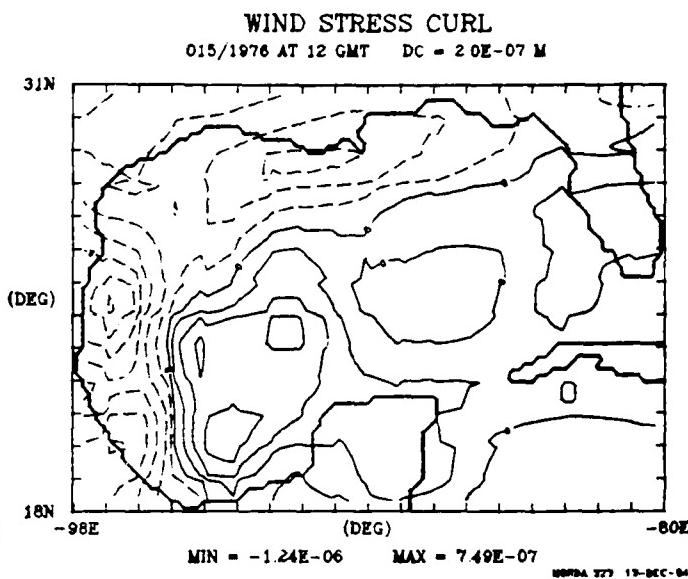
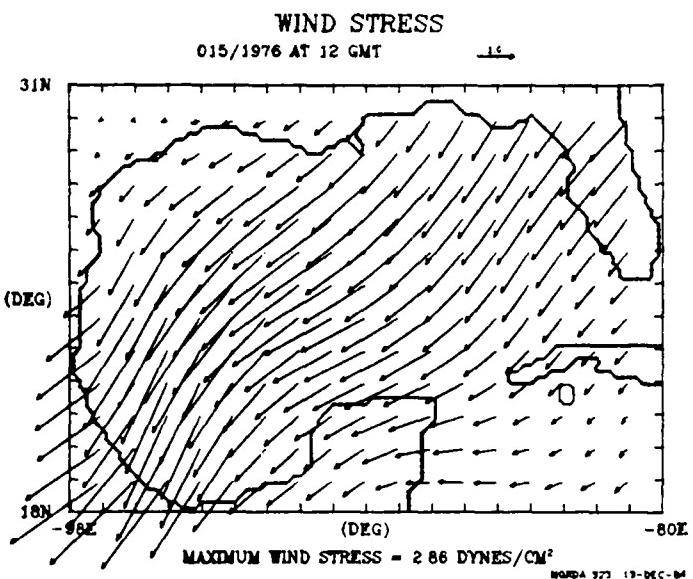
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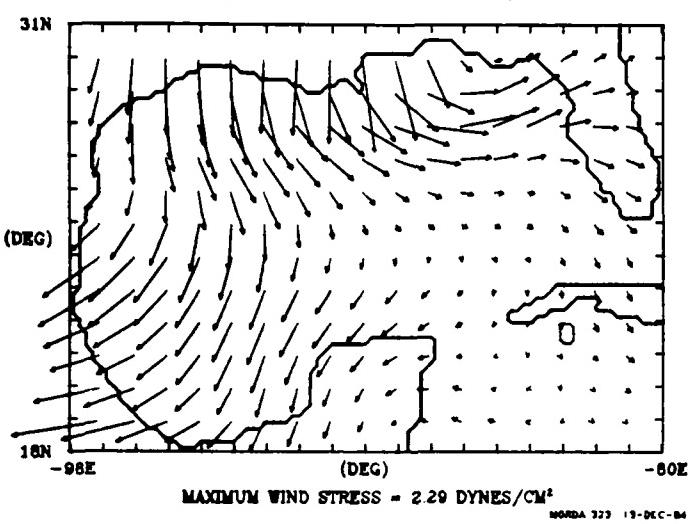
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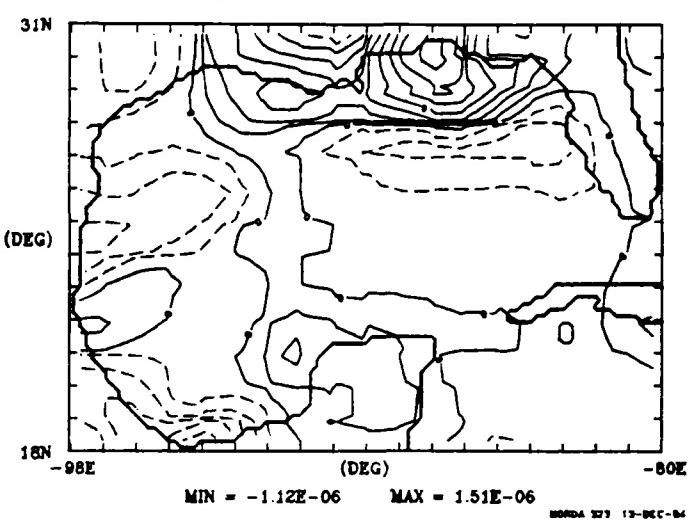




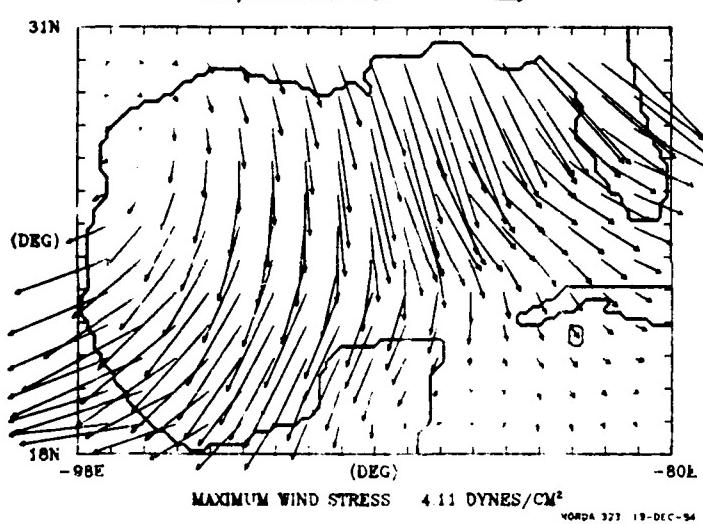
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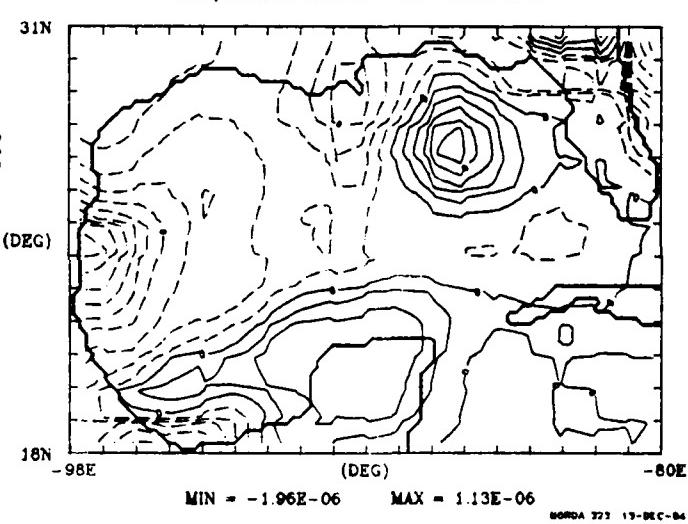
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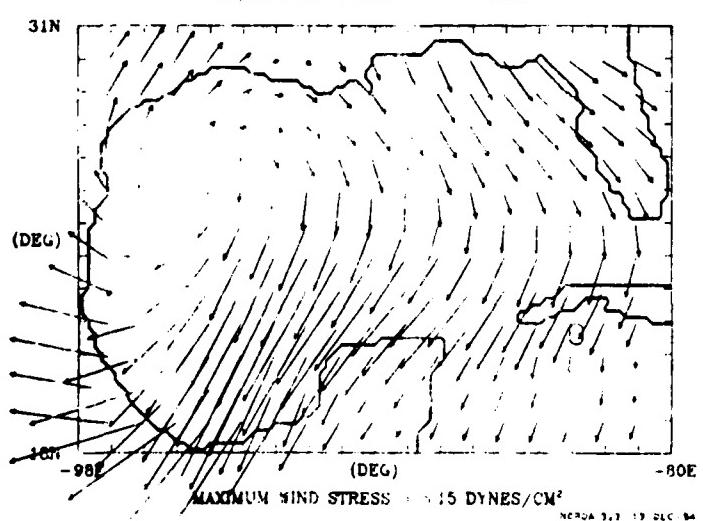
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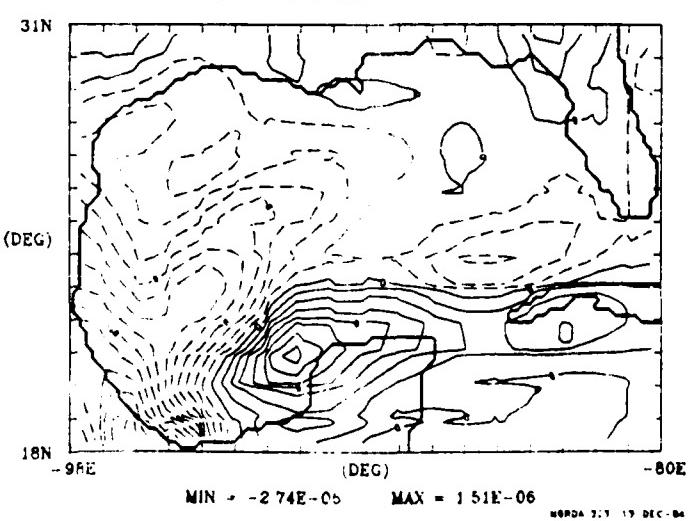
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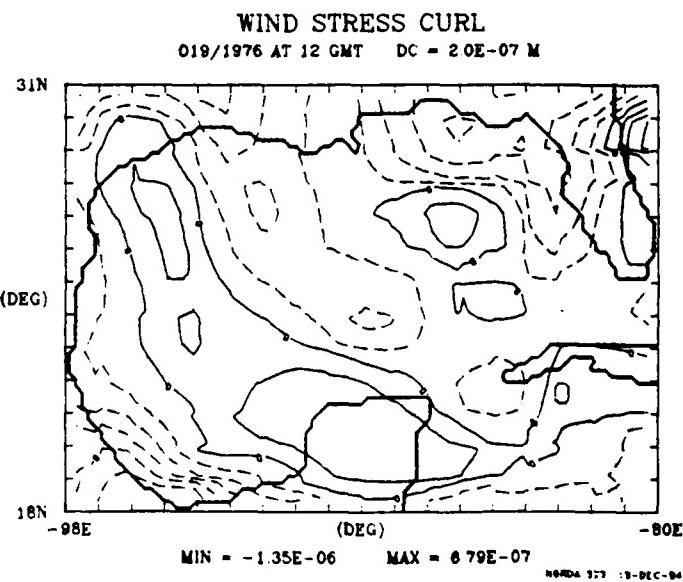
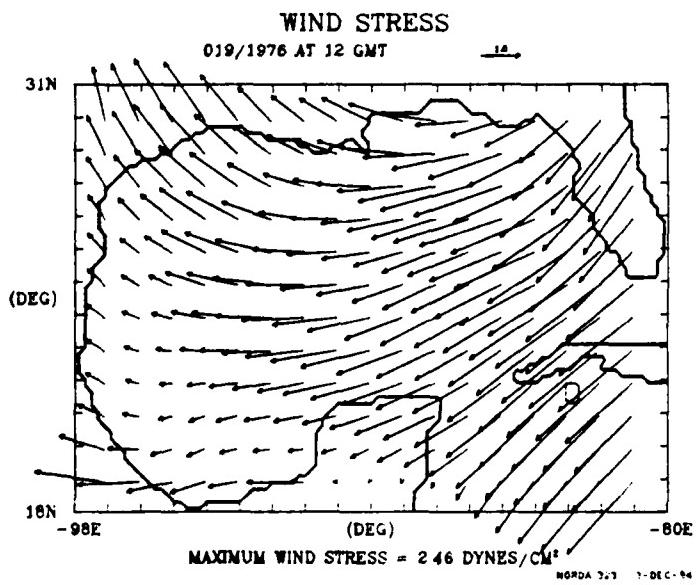
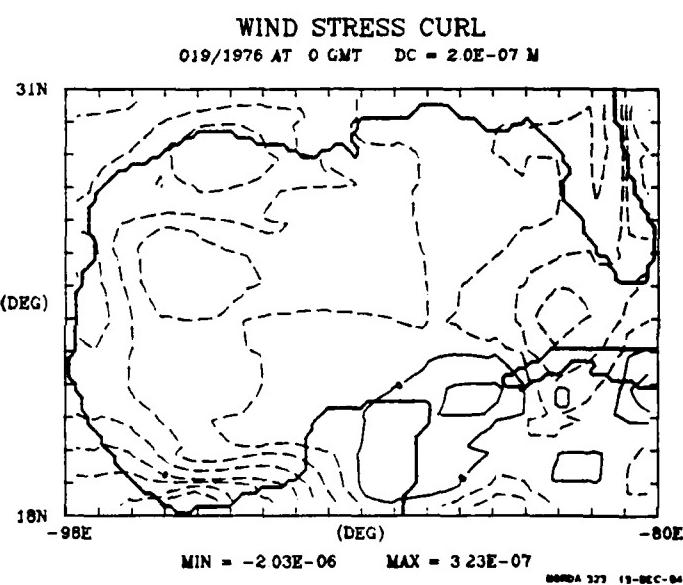
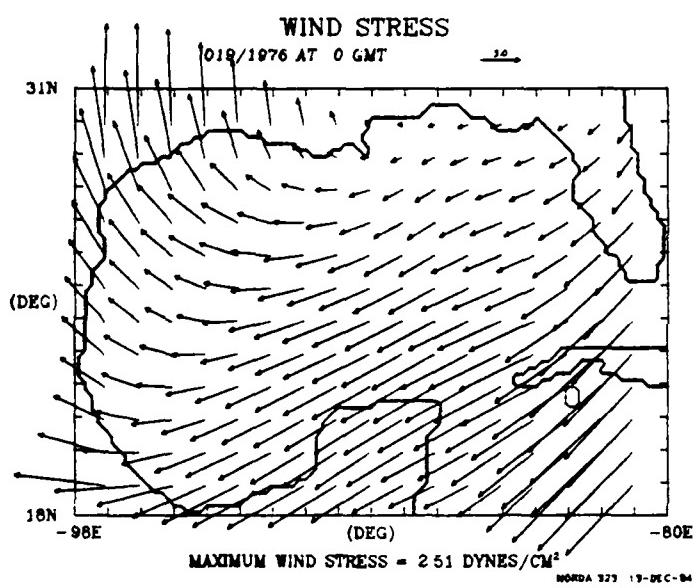
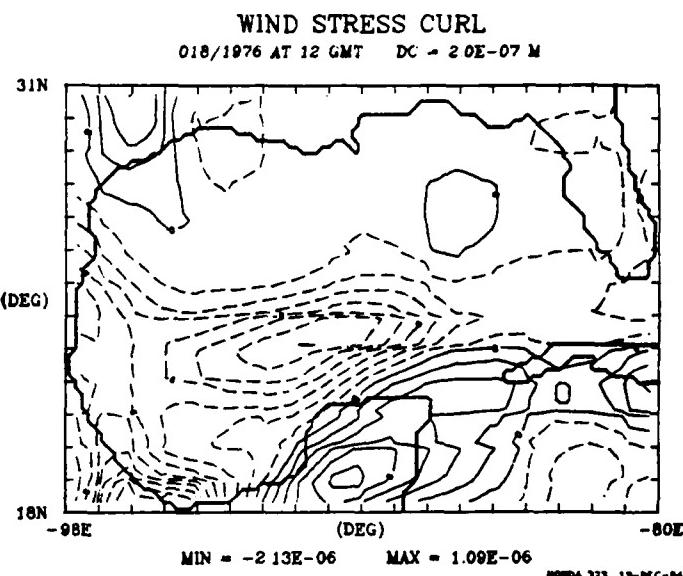
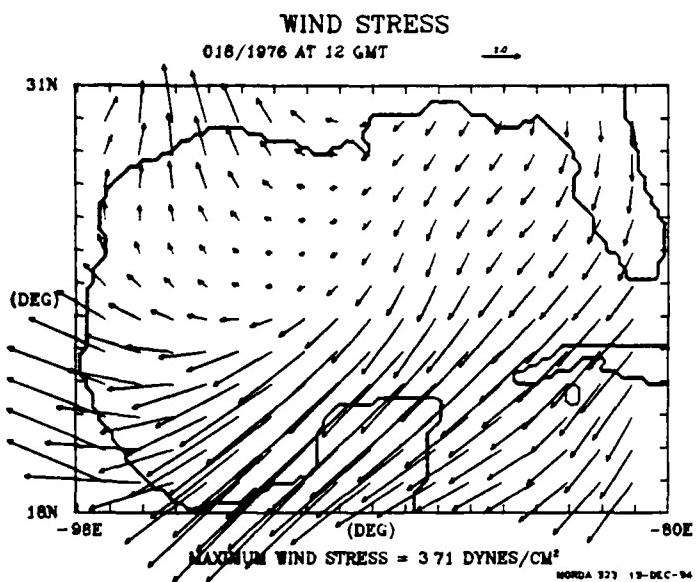


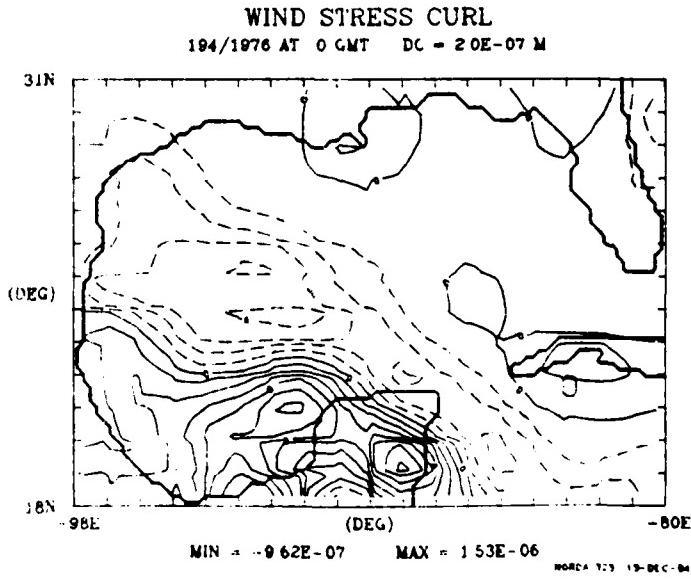
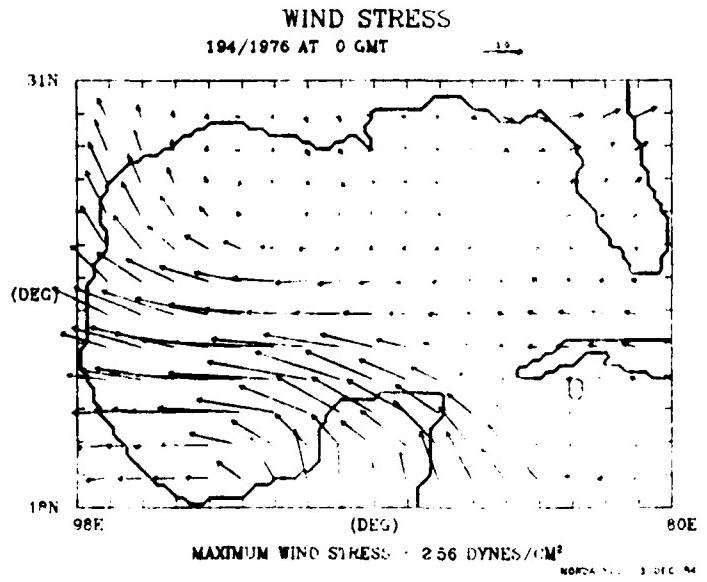
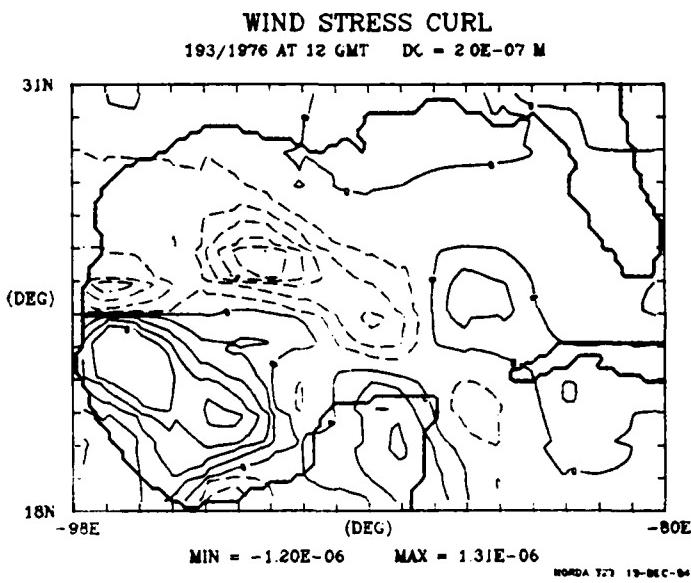
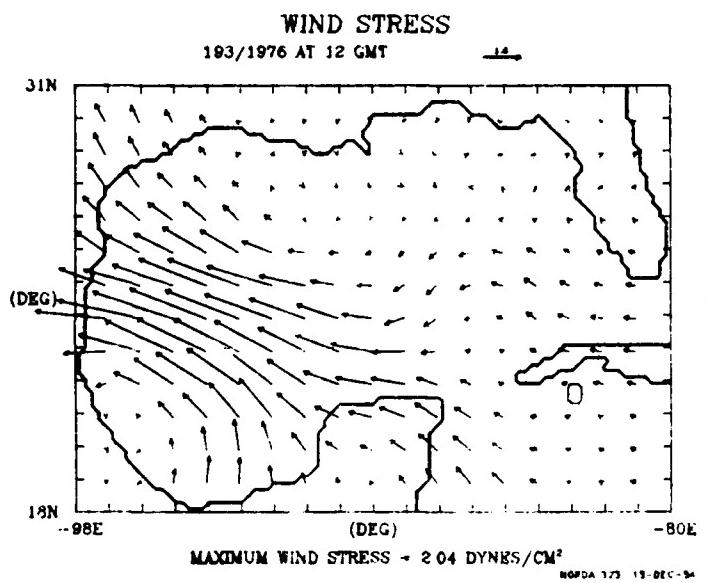
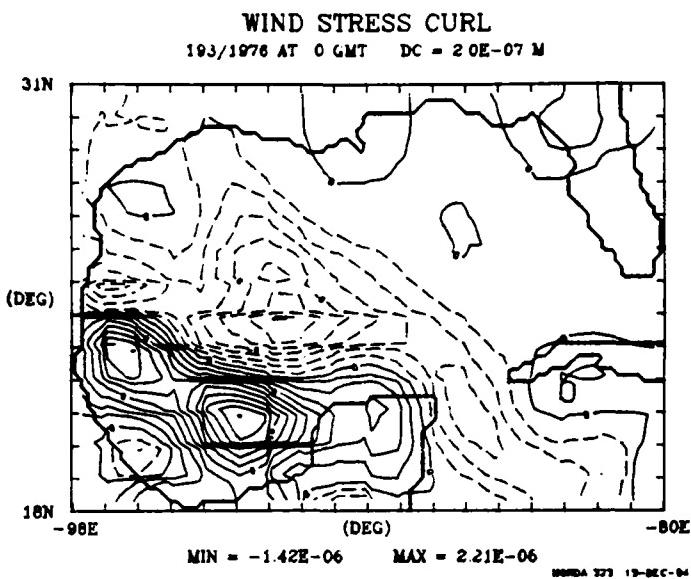
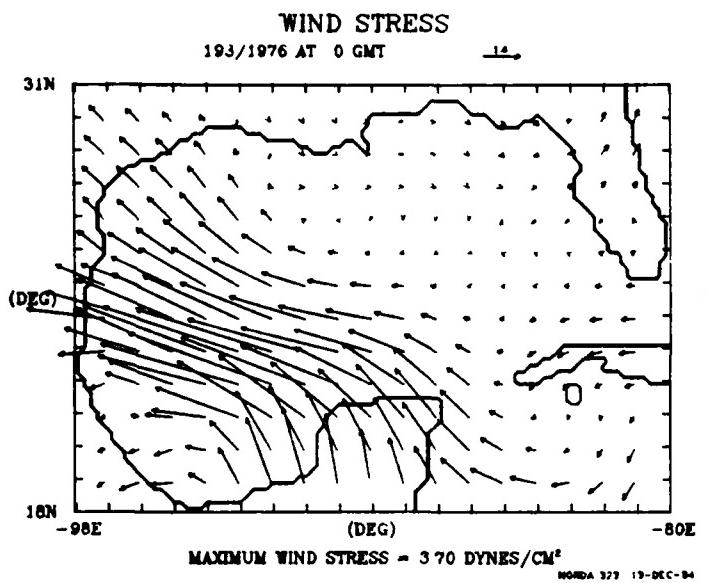
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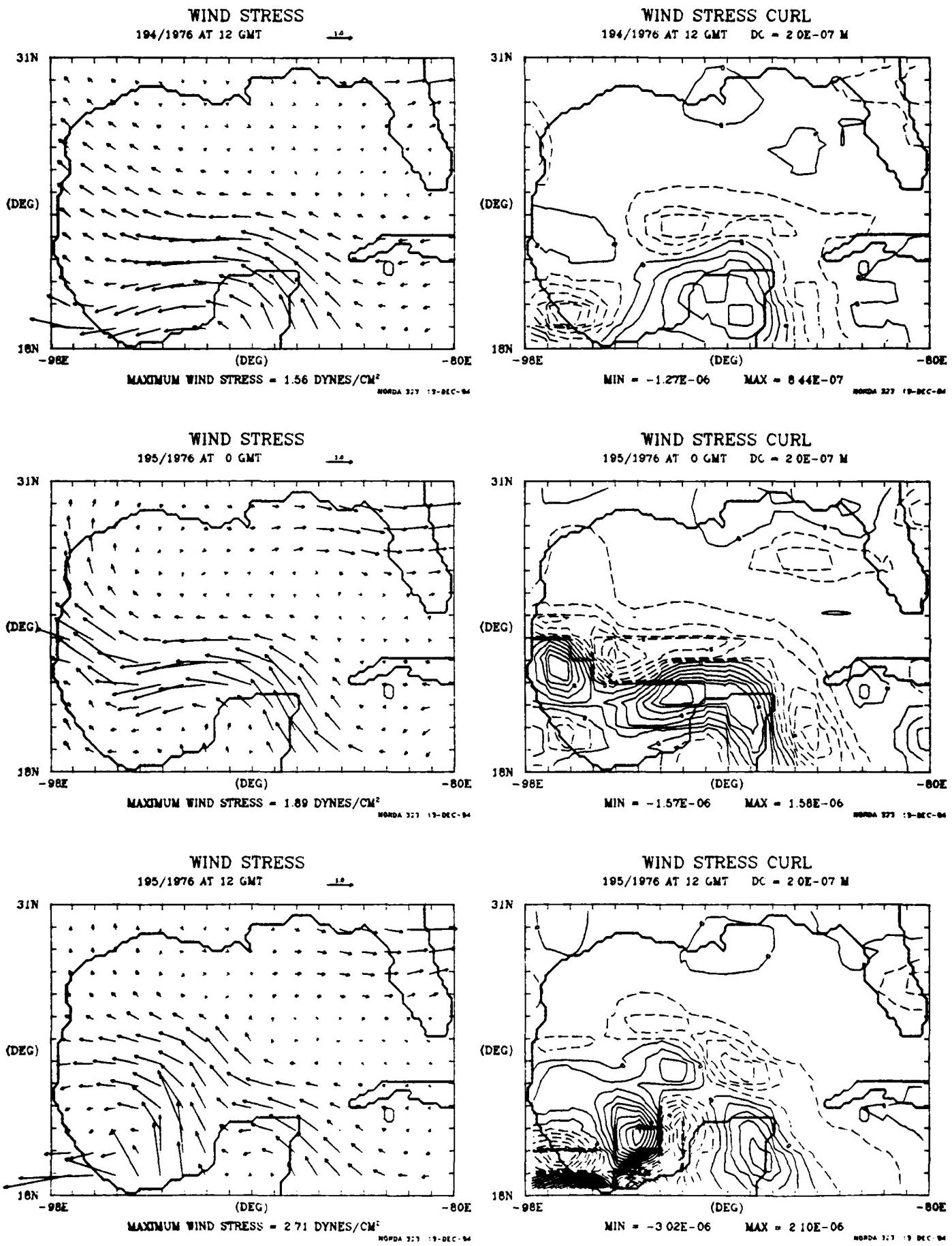


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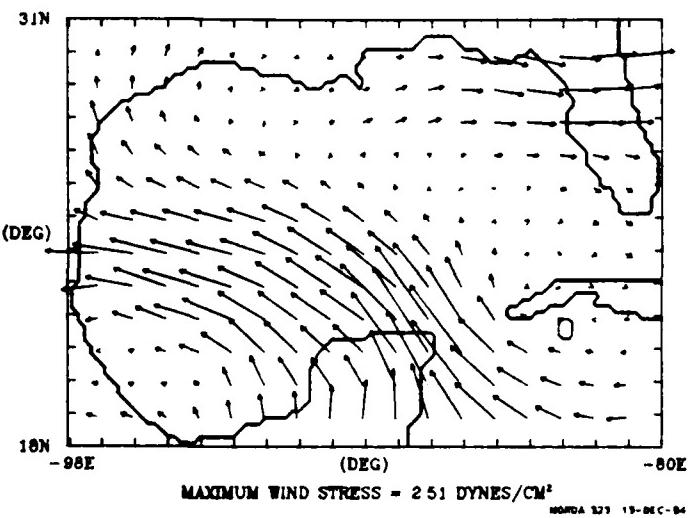




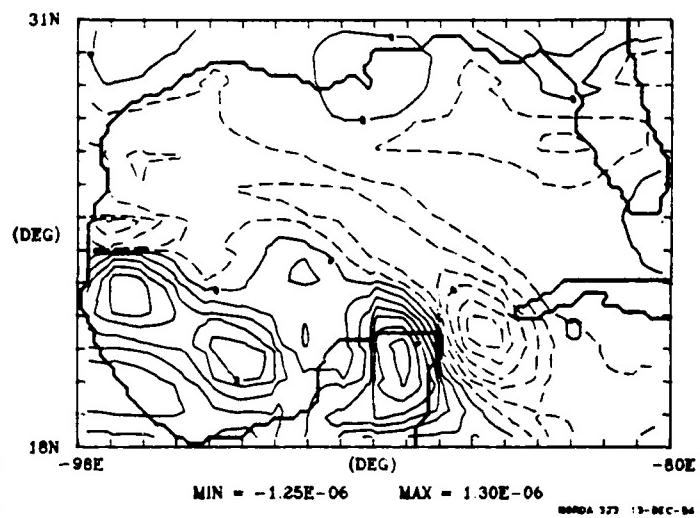


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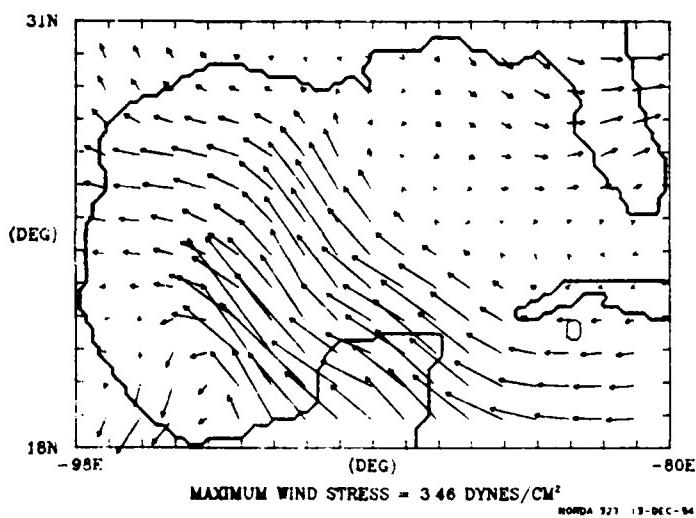


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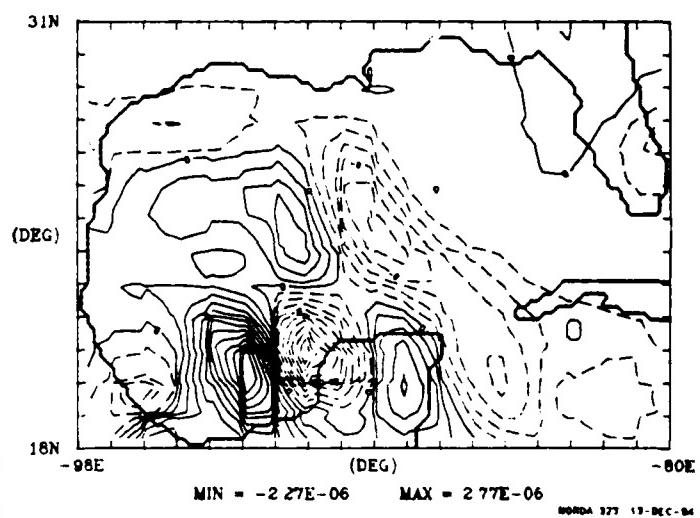


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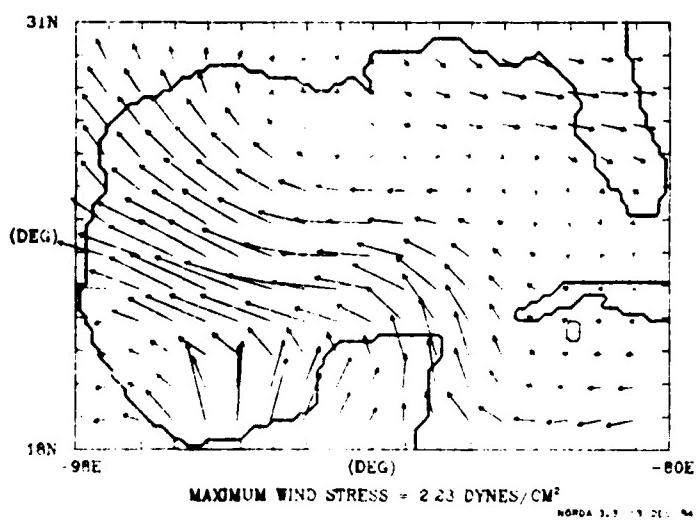


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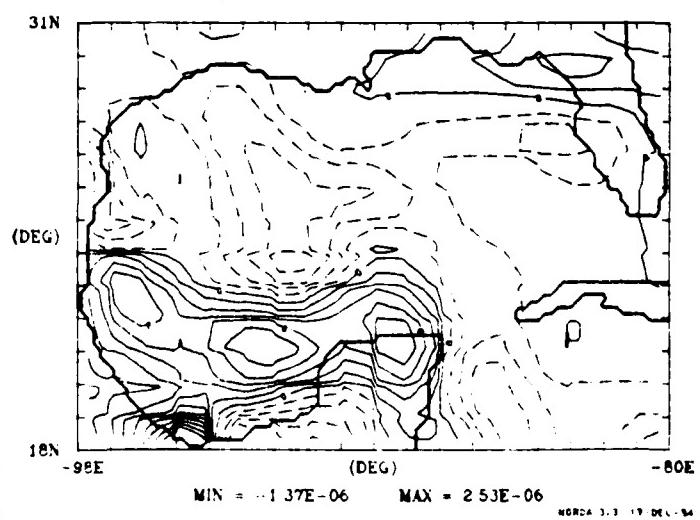


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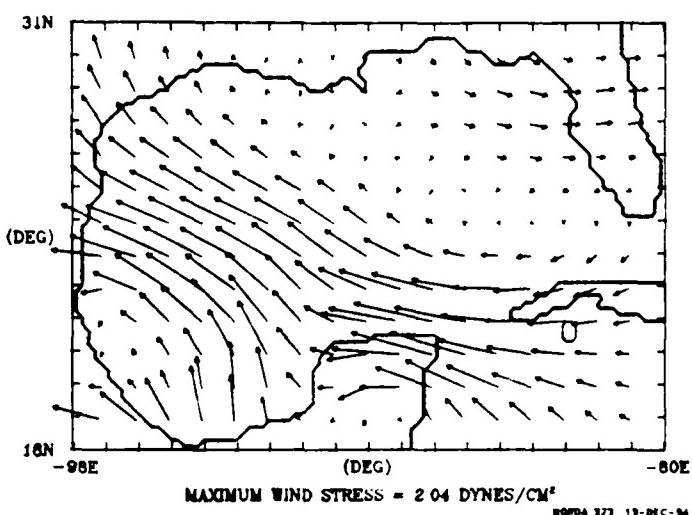
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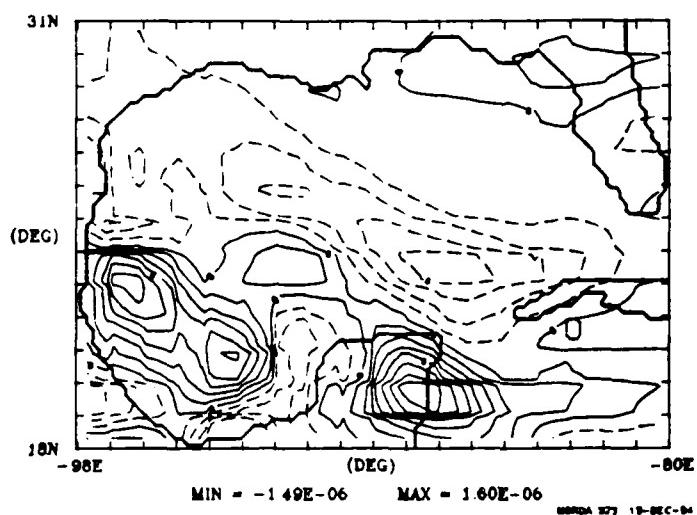
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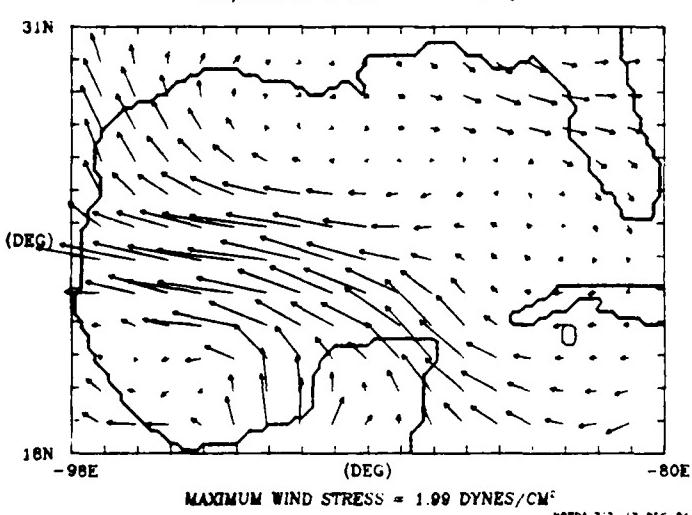
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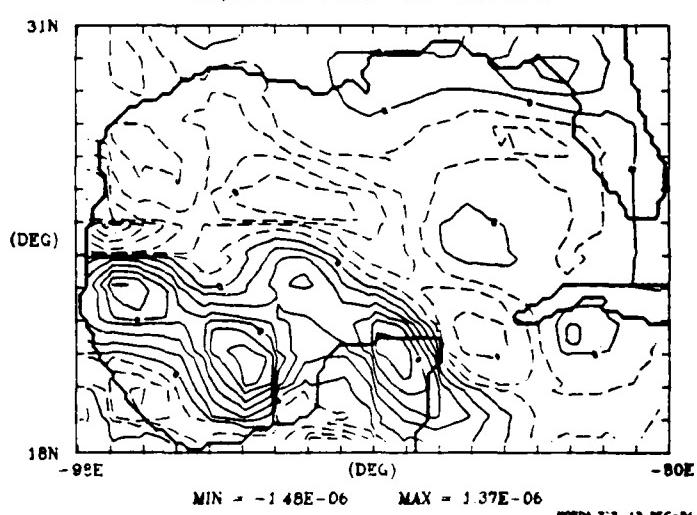
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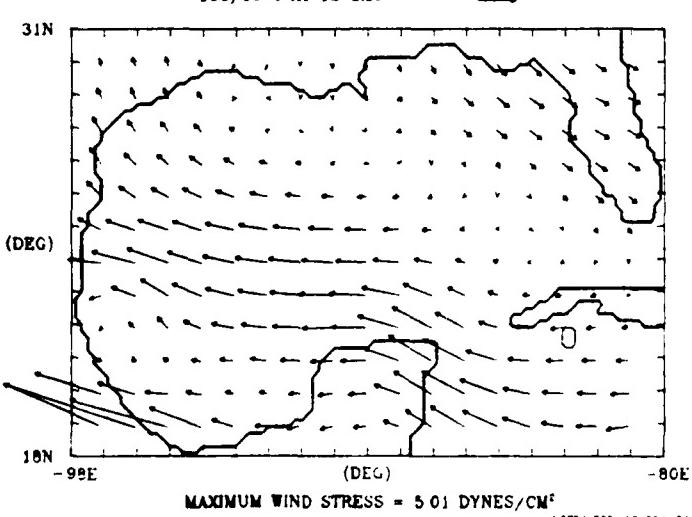
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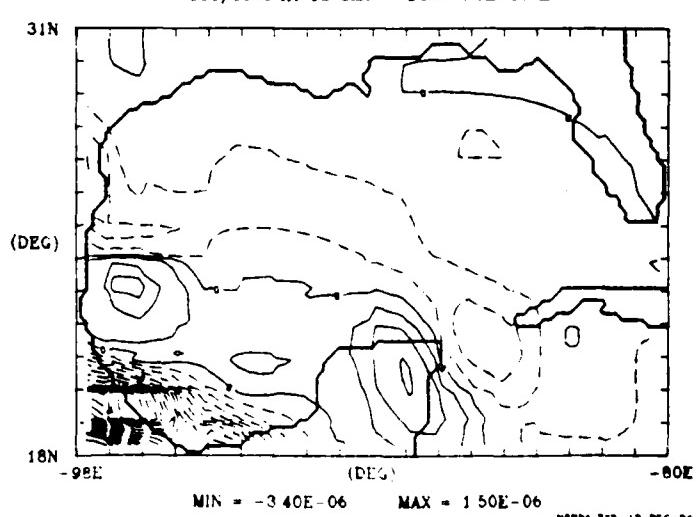
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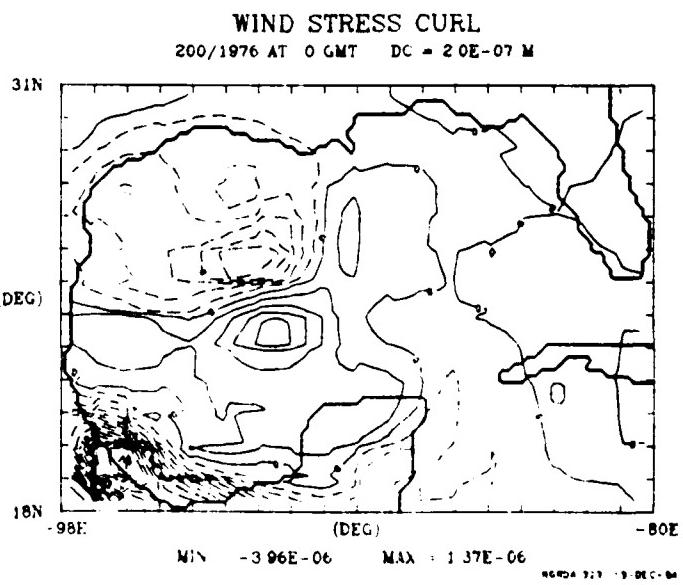
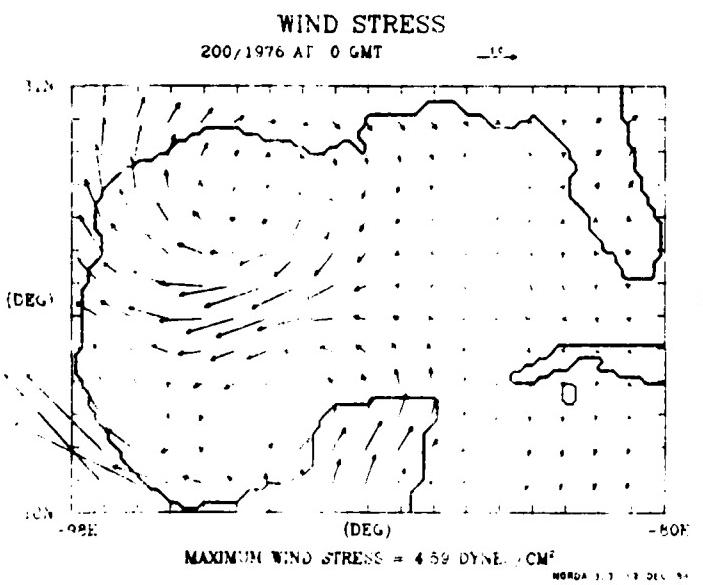
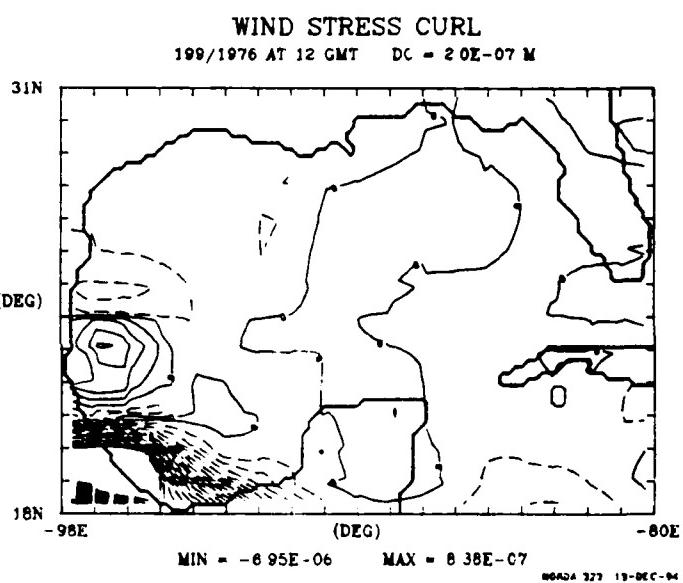
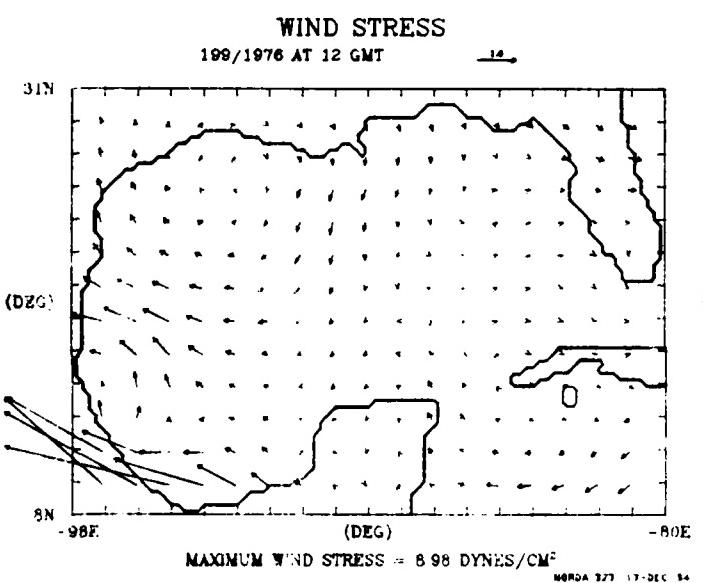
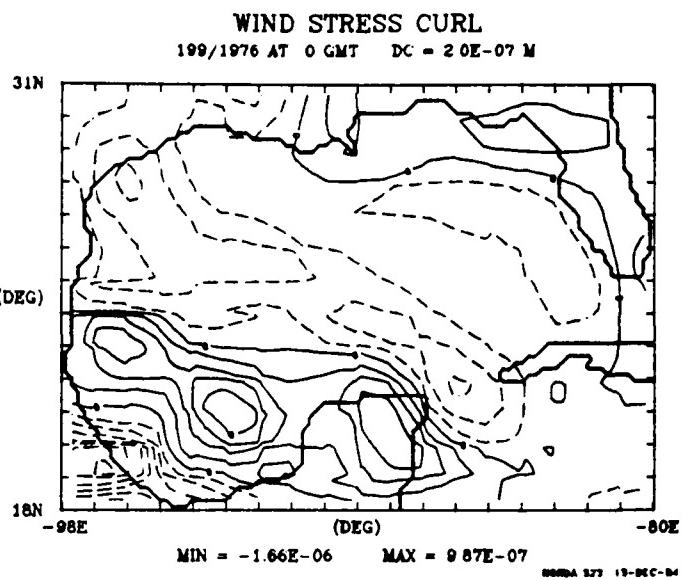
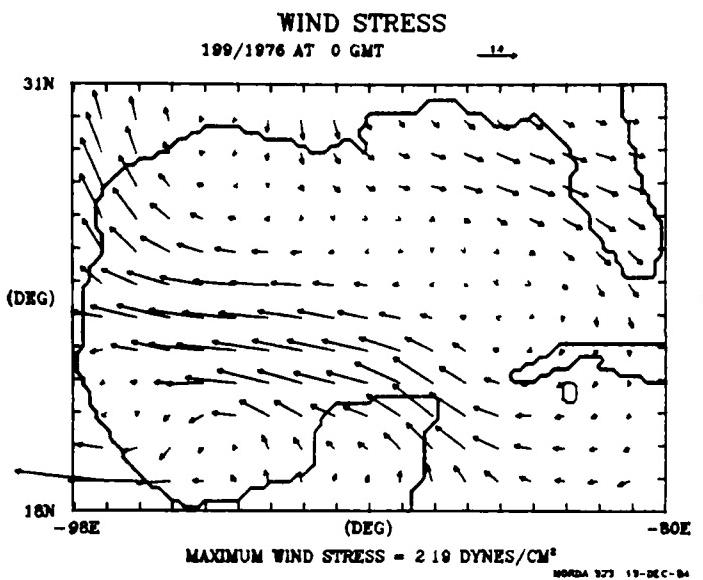


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WIND STRESS CURL
198/1976 AT 12 GMT DC = 2.0E-07 M

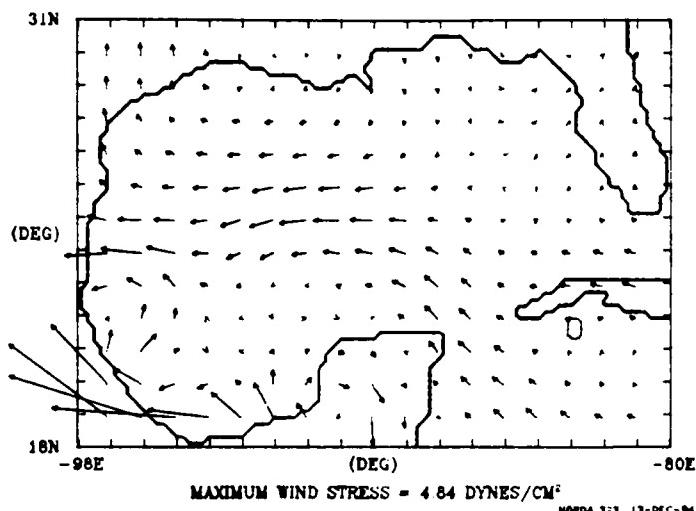




WIND STRESS

200/1976 AT 12 GMT

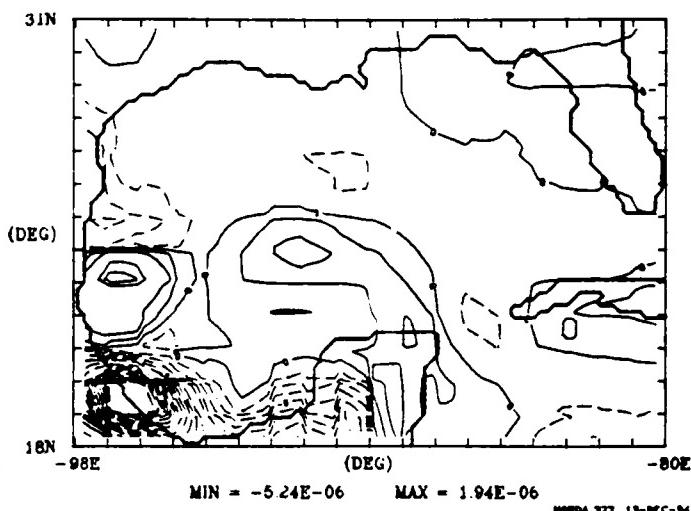
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MAXIMUM WIND STRESS = 4.84 DYNES/CM²

NODA 323 19-DEC-94

WIND STRESS CURL

200/1976 AT 12 GMT DC = 2.0E-07 M



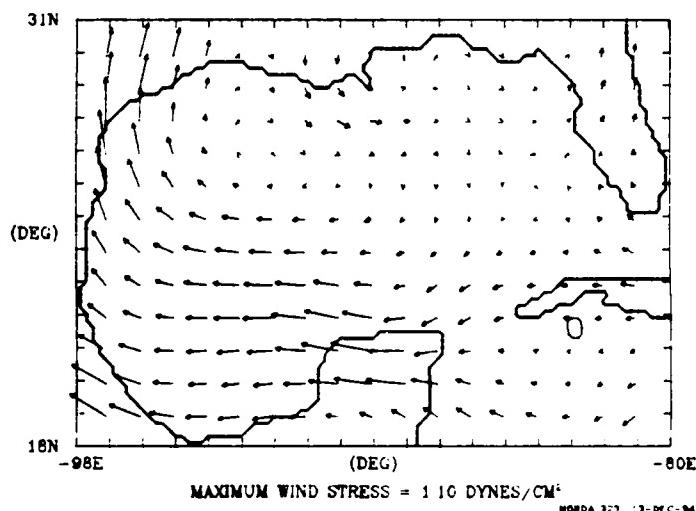
MIN = -5.24E-06 MAX = 1.94E-06

NODA 323 19-DEC-94

WIND STRESS

201/1976 AT 0 GMT

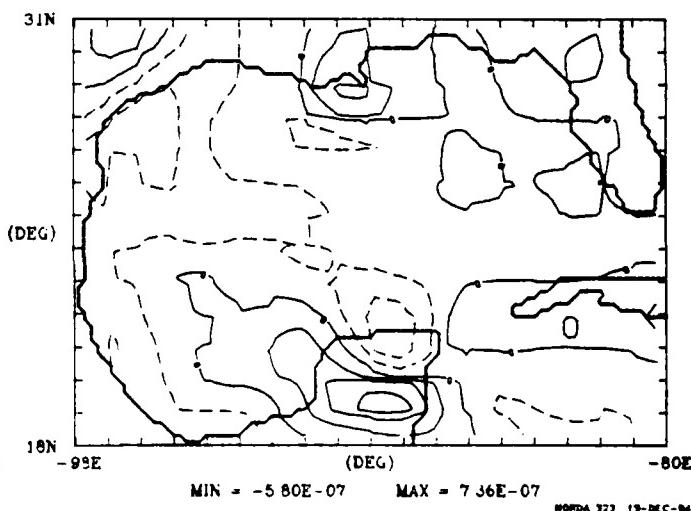
10

MAXIMUM WIND STRESS = 1.10 DYNES/CM²

NODA 323 19-DEC-94

WIND STRESS CURL

201/1976 AT 0 GMT DC = 2.0E-07 M



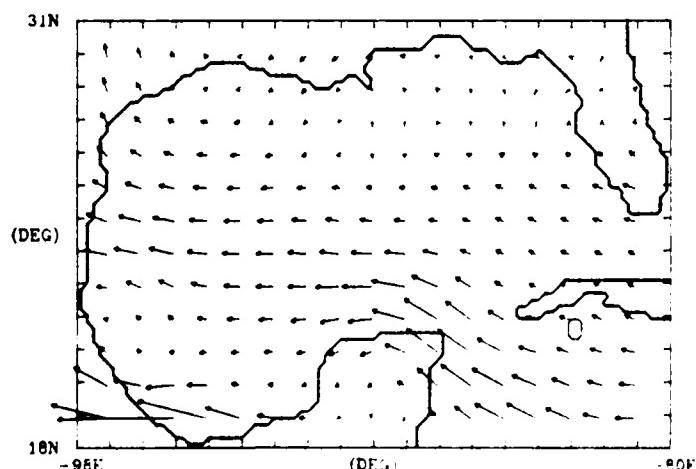
MIN = -5.80E-07 MAX = 7.36E-07

NODA 323 19-DEC-94

WIND STRESS

201/1976 AT 12 GMT

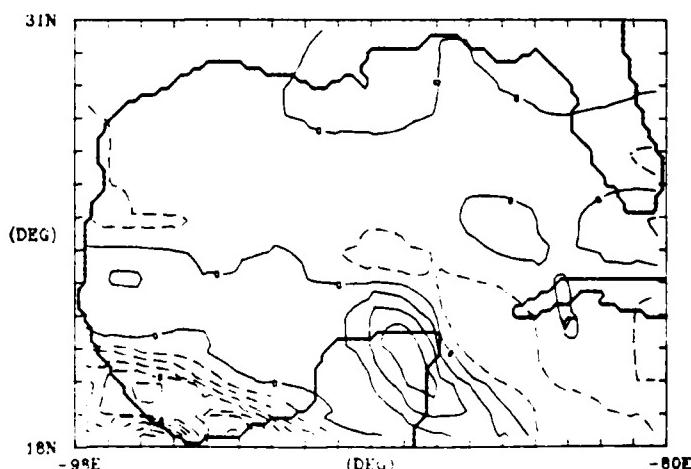
10

MAXIMUM WIND STRESS = 2.33 DYNES/CM²

NODA 323 19-DEC-94

WIND STRESS CURL

201/1976 AT 12 GMT DC = 2.0E-07 M



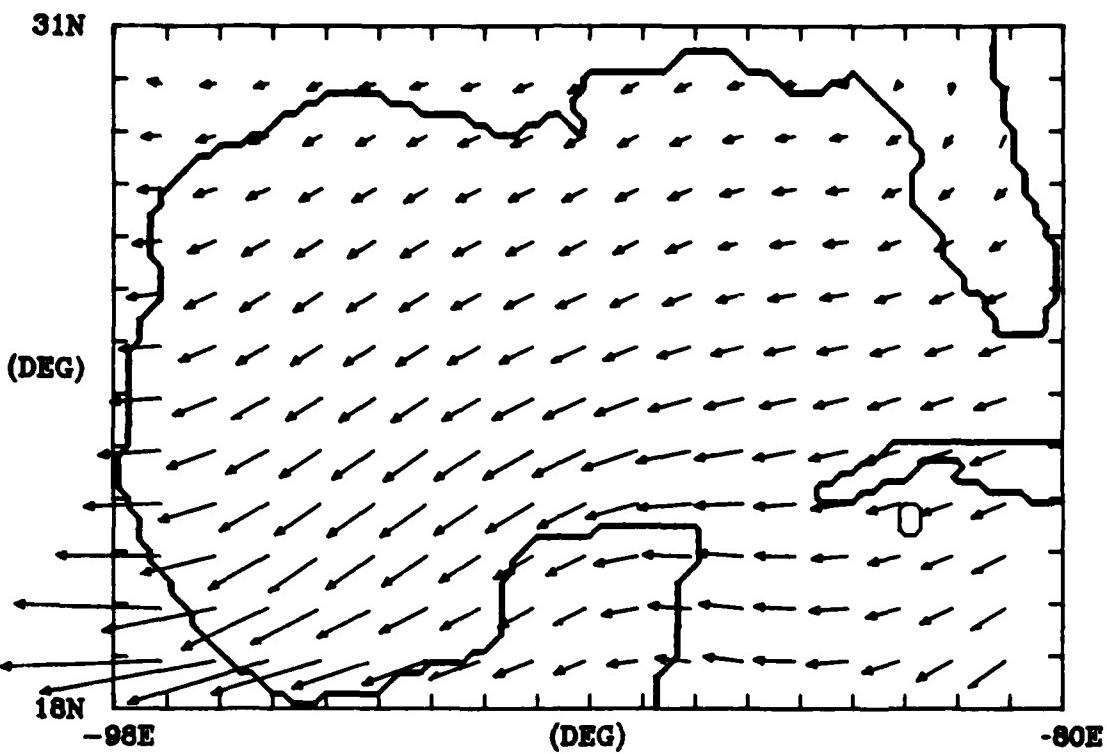
MIN = -2.47E-06 MAX = 7.48E-07

NODA 323 19-DEC-94

APPENDIX B: SEASONALLY AVERAGED WIND STRESS AND WIND STRESS CURL CLIMATOLOGIES
FOR THE PERIOD 1967-1982

WIND STRESS
WINTER 1967-1982

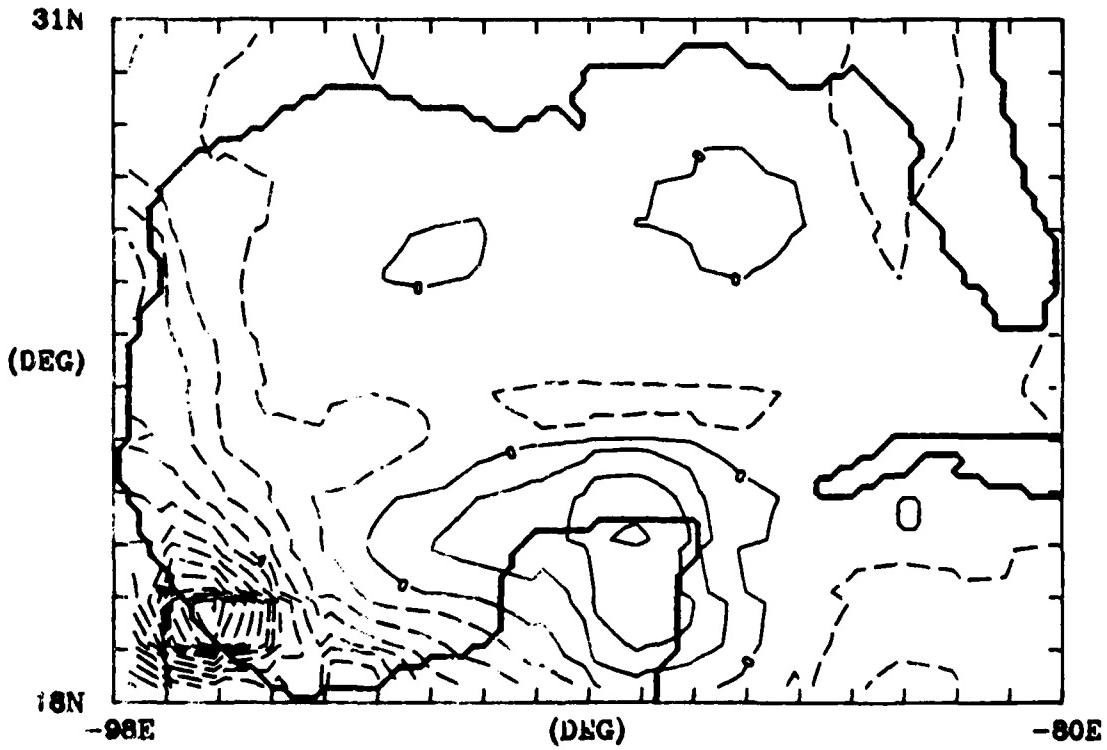
10



MAXIMUM WIND STRESS = 2.79 DYNES/CM²

NODA 322 12-DEC-84

WIND STRESS CURL
WINTER 1967-1982 DC = 1.0E-07 MKS

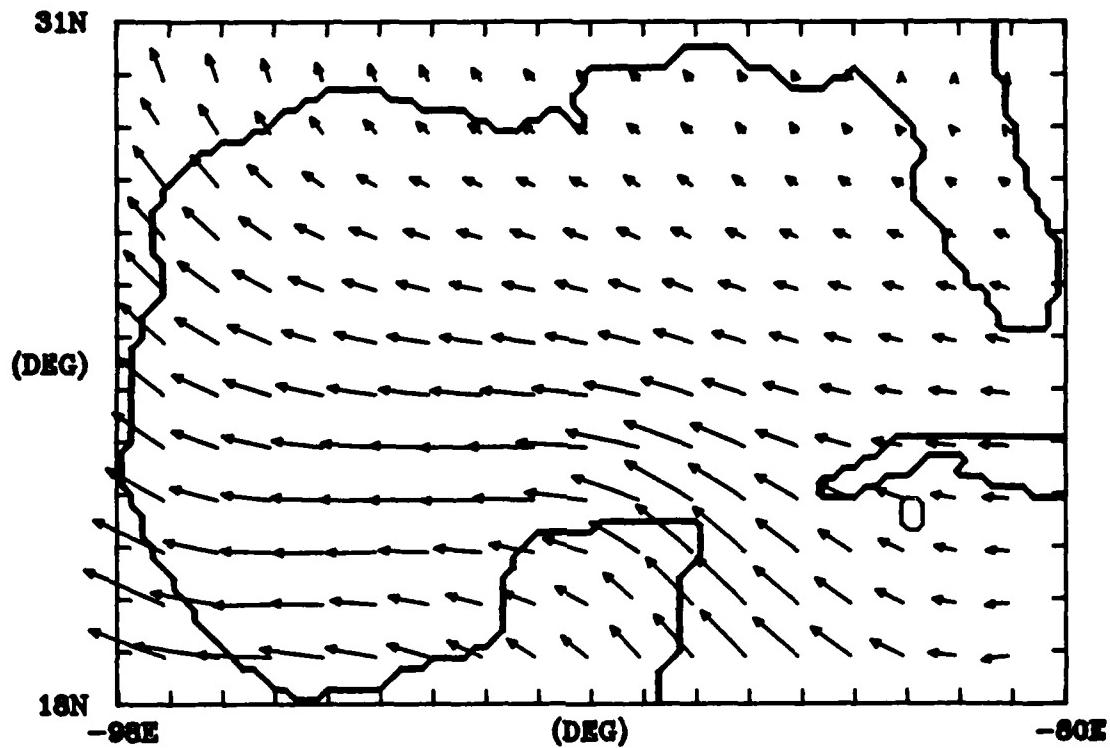


MIN = -1.42E-08 MAX = 3.15E-07

NODA 322 12-DEC-84

WIND STRESS
SPRING 1967-1982

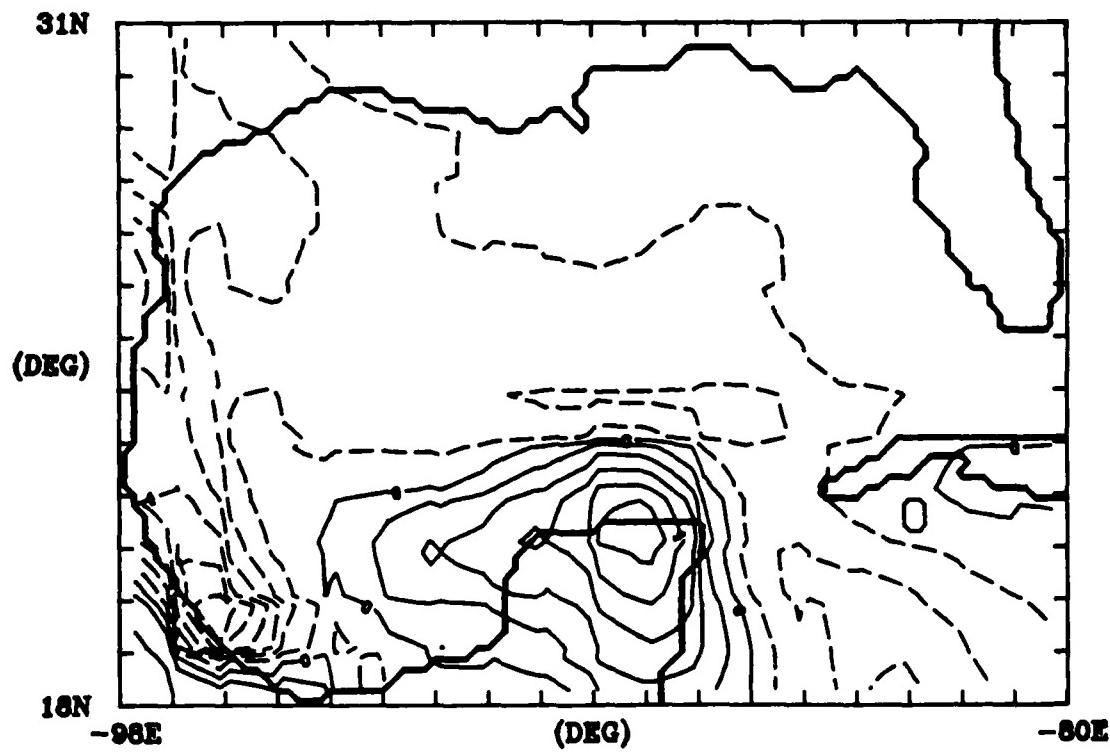
→



MAXIMUM WIND STRESS = 1.33 DYNES/CM²

NODA 323 12-DEC-84

WIND STRESS CURL
SPRING 1967-1982 DC = 1.0E-07 MKS



MIN = -7.86E-07 MAX = 5.85E-07

NODA 323 12-DEC-84

WIND STRESS
SUMMER 1967-1982

10

31N

(DEG)

18N

-98E

(DEG)

-80E

MAXIMUM WIND STRESS = 1.29 DYNES/CM²

NORDA 323 12-DEC-84

WIND STRESS CURL

SUMMER 1967-1982 DC = 1.0E-07 MKS

31N

(DEG)

18N

-98E

(DEG)

-80E

MIN = -8.64E-07 MAX = 4.31E-07

NORDA 323 12-DEC-84

WIND STRESS
FALL 1967-1982

10

31N

(DEG)

18N

-98E

(DEG)

-80E

MAXIMUM WIND STRESS = 1.84 DYNES/CM²

NORDA 323 12-DEC-84

WIND STRESS CURL
FALL 1967-1982 DC = 1.0E-07 MKS

31N

(DEG)

18N

-98E

(DEG)

-80E

MIN = -9.53E-07

MAX = 3.22E-07

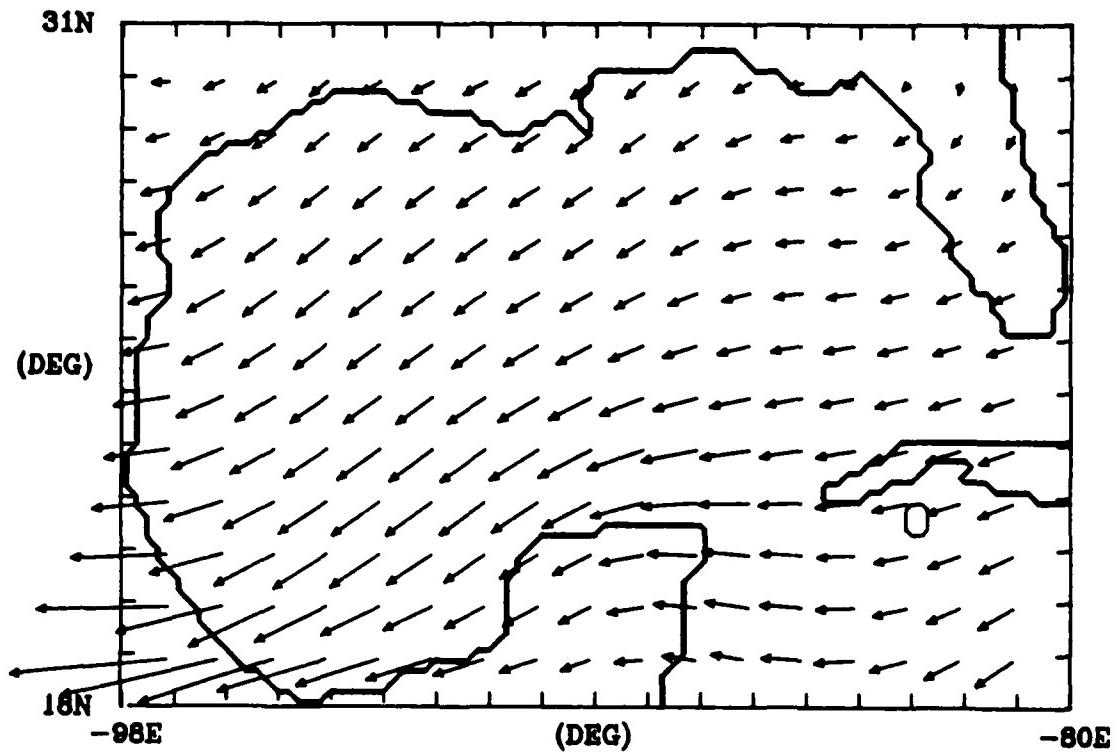
NORDA 323 12-DEC-84

APPENDIX C: MONTHLY AVERAGED WIND STRESS AND WIND STRESS CURL CLIMATOLOGIES
FOR THE PERIOD 1967-1982

WIND STRESS
JANUARY 1967-1982

10

31N

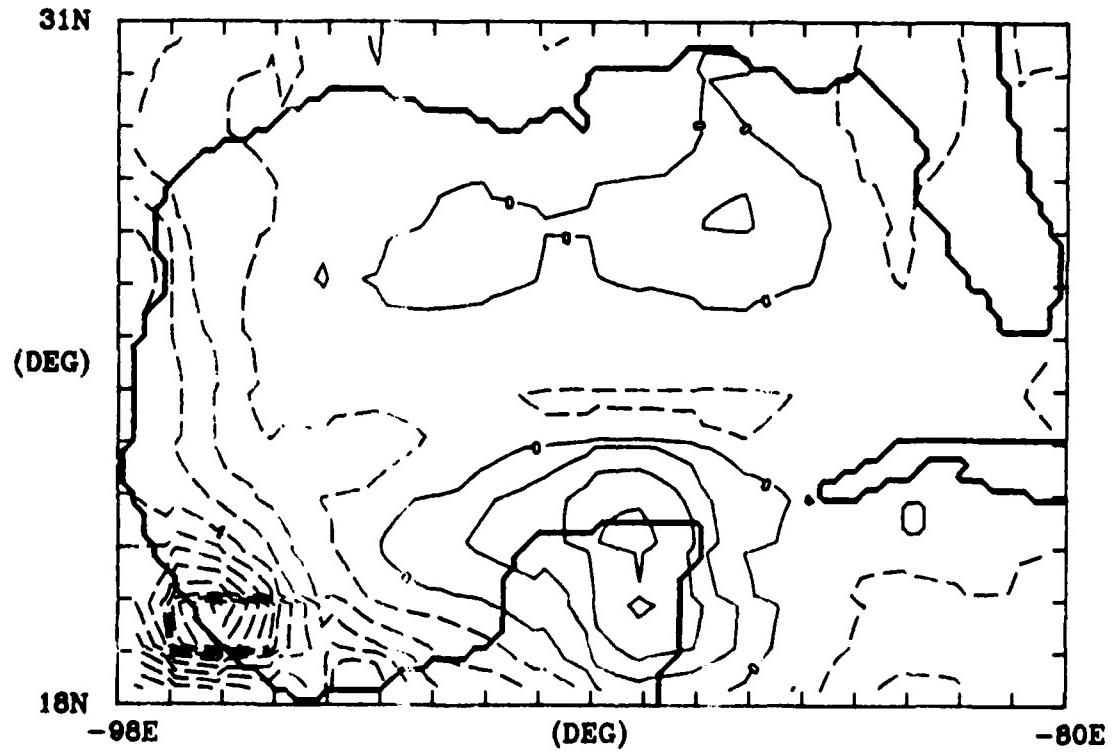


MAXIMUM WIND STRESS = 2.53 DYNES/CM²

NORDA 323 13-DEC-84

WIND STRESS CURL
JANUARY 1967-1982 DC = 1.0E-07

31N

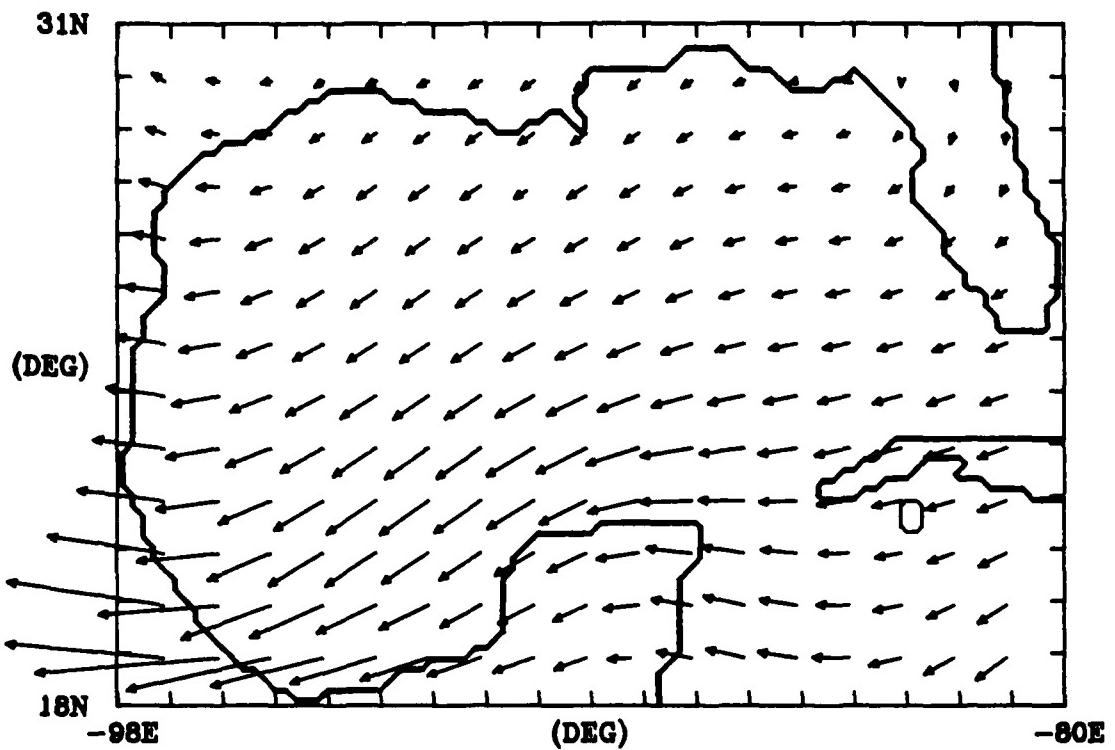


MIN = -1.23E-06 MAX = 3.29E-07

NORDA 323 13-DEC-84

WIND STRESS
FEBRUARY 1967-1982

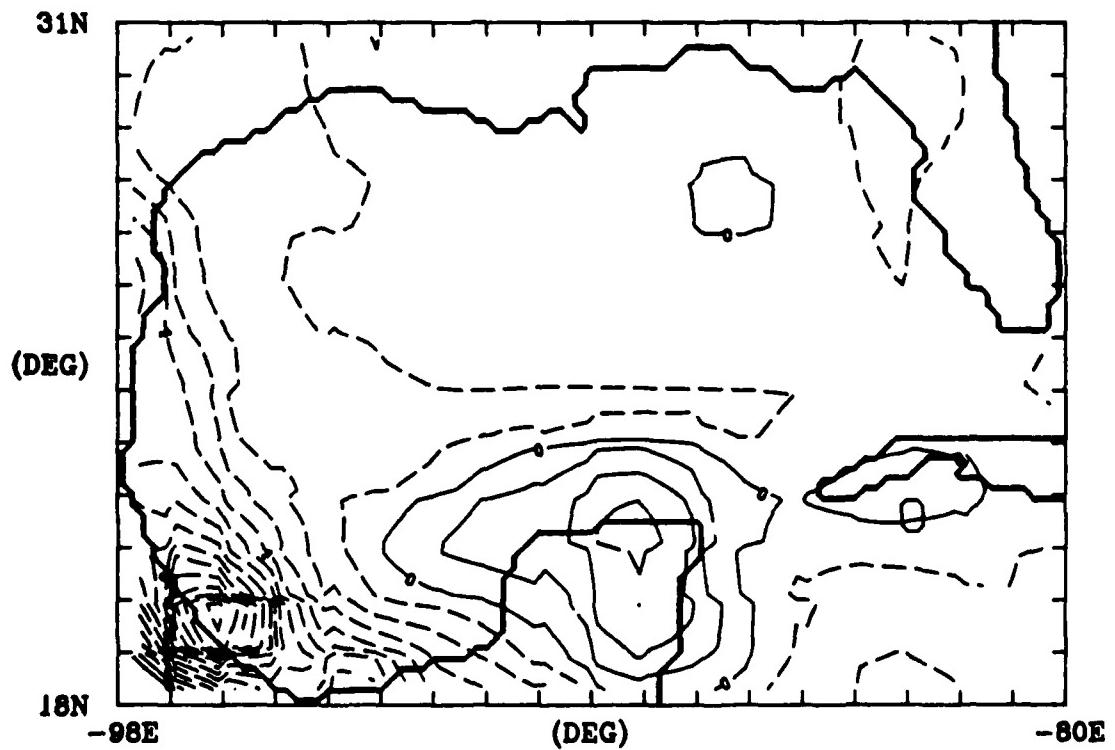
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MAXIMUM WIND STRESS = 2.92 DYNES/CM²

NORDA 323 13-DEC-84

WIND STRESS CURL
FEBRUARY 1967-1982 DC = 1.0E-07

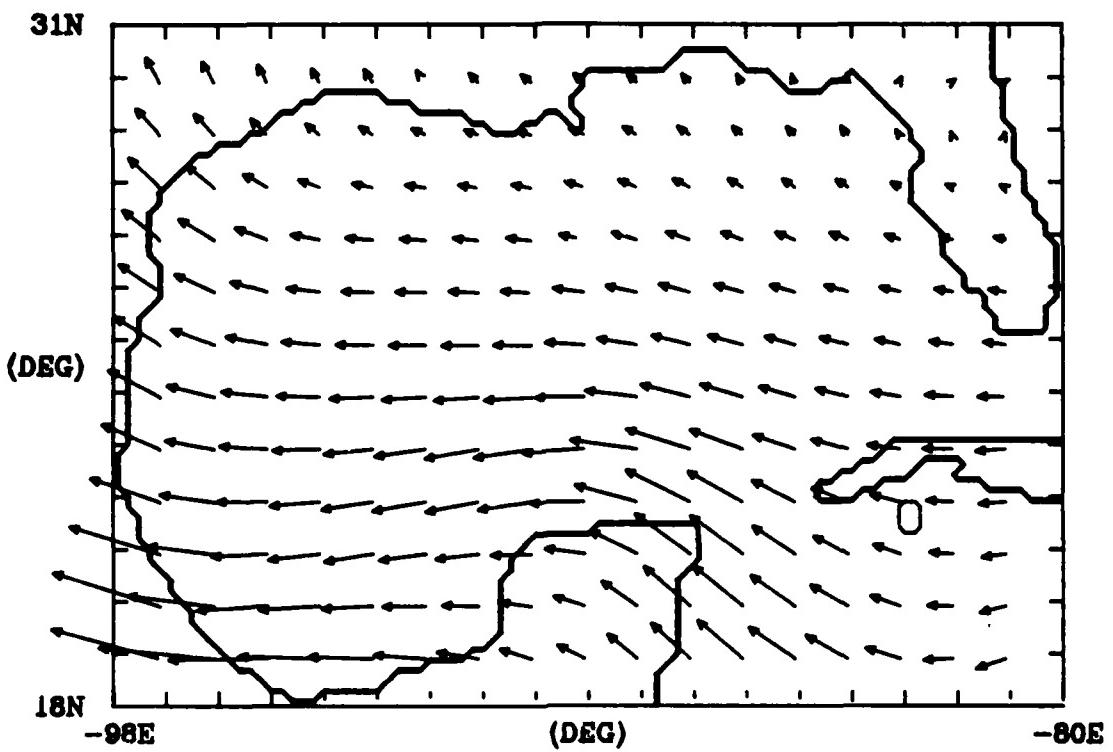


MIN = -1.57E-06 MAX = 3.93E-07

NORDA 323 13-DEC-84

WIND STRESS
MARCH 1967-1982

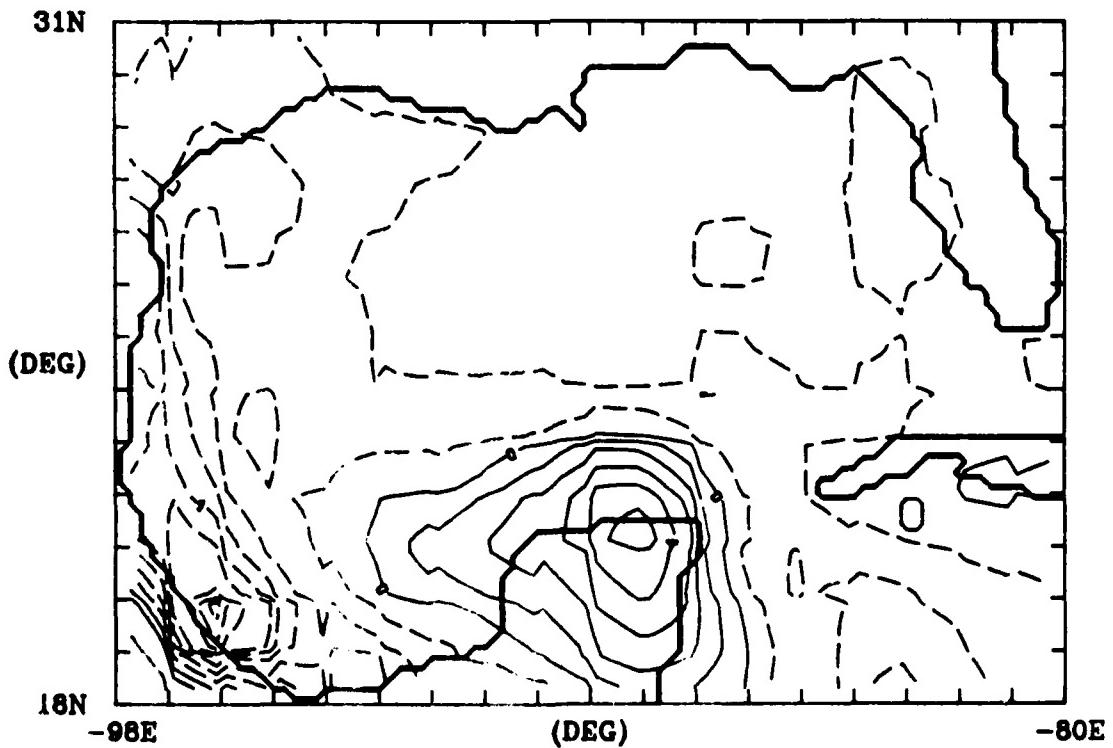
10



MAXIMUM WIND STRESS = 1.76 DYNES/CM²

NODA 323 13-DEC-84

WIND STRESS CURL
MARCH 1967-1982 DC = 1.0E-07

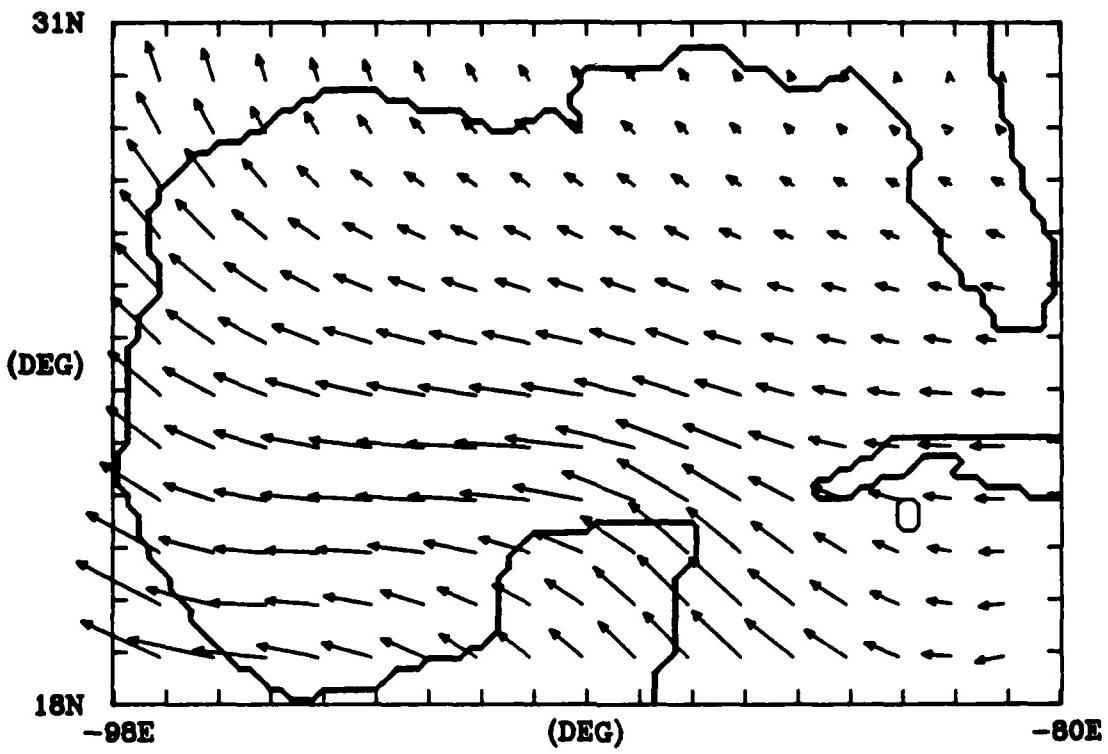


MIN = -9.55E-07 MAX = 6.17E-07

NODA 323 13-DEC-84

WIND STRESS
APRIL 1967-1982

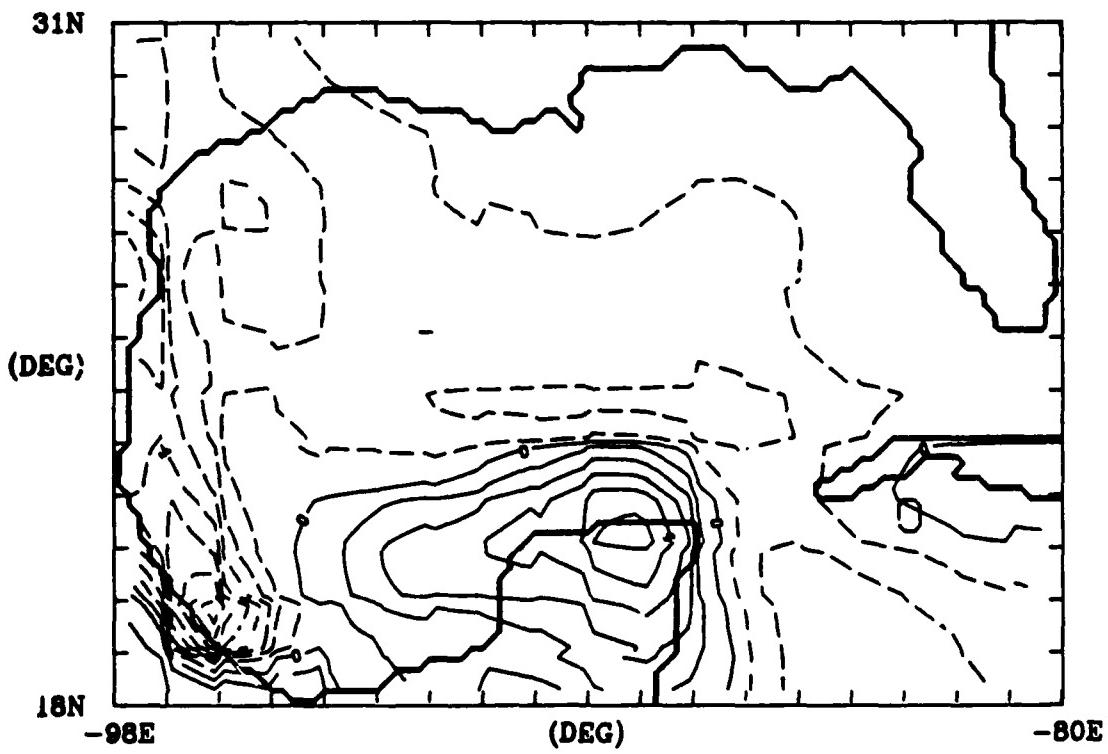
10



MAXIMUM WIND STRESS = 1.43 DYNES/CM²

NODA 323 13-DEC-84

WIND STRESS CURL
APRIL 1967-1982 DC = 1.0E-07



MIN = -8.92E-07 MAX = 6.94E-07

NODA 323 13-DEC-84

WIND STRESS
MAY 1967-1982

10

31N

(DEG)

18N

-98E

(DEG)

-80E

MAXIMUM WIND STRESS = 1.16 DYNES/CM²

NORDA 323 13-DEC-84

WIND STRESS CURL
MAY 1967-1982 DC = 1.0E-07

31N

(DEG)

18N

-98E

(DEG)

-80E

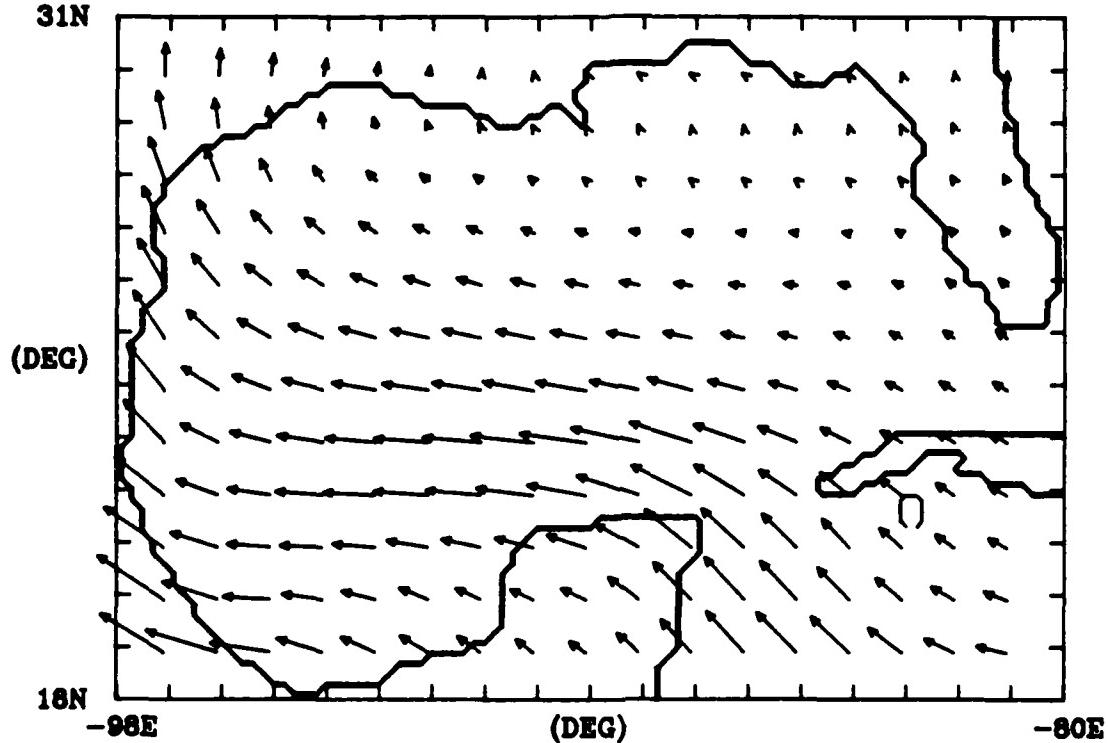
MIN = -5.70E-07 MAX = 6.35E-07

NORDA 323 13-DEC-84

WIND STRESS
JUNE 1967-1982

10

31N

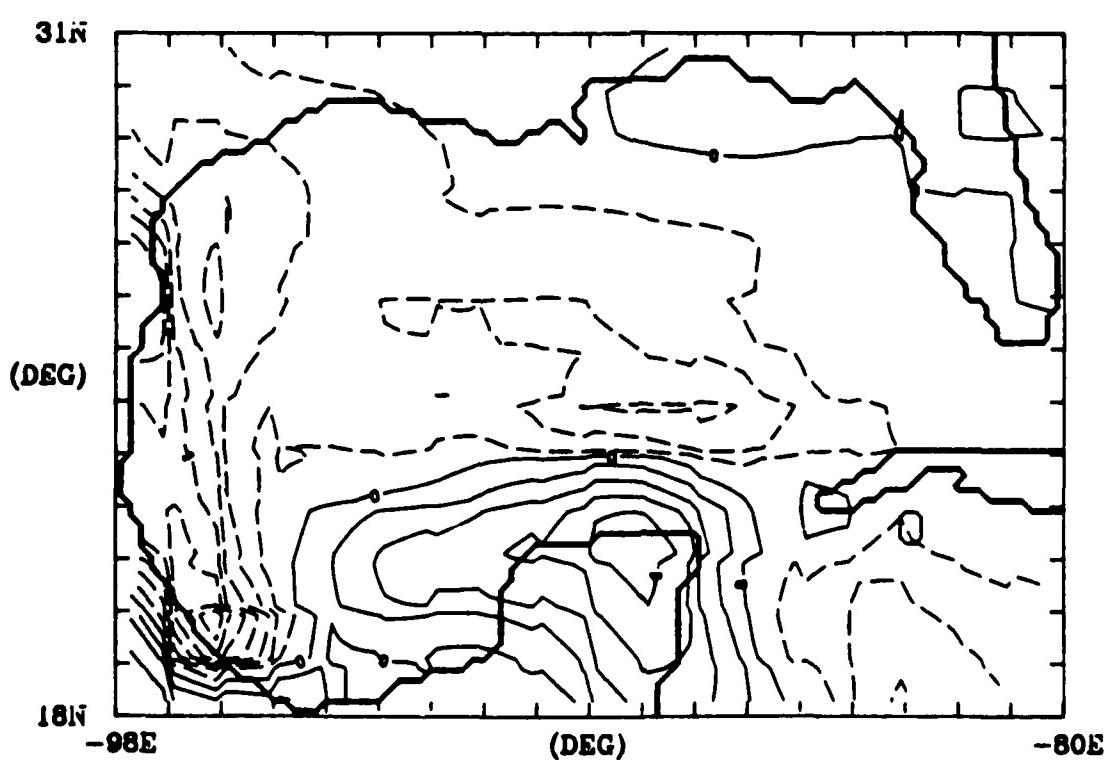


MAXIMUM WIND STRESS = 1.22 DYNES/CM²

NODA 323 13-DEC-84

WIND STRESS CURL
JUNE 1967-1982 DC = 1.0E-07

31N



MIN = -8.07E-07 MAX = 5.13E-07

NODA 323 13-DEC-84

WIND STRESS
JULY 1967-1982

10

31N

(DEG)

18N

-90E

(DEG)

-80E

MAXIMUM WIND STRESS = 1.47 DYNES/CM²

NODA 323 13-DEC-84

WIND STRESS CURL
JULY 1967-1982 DC = 1.0E-07

31N

(DEG)

18N

-90E

(DEG)

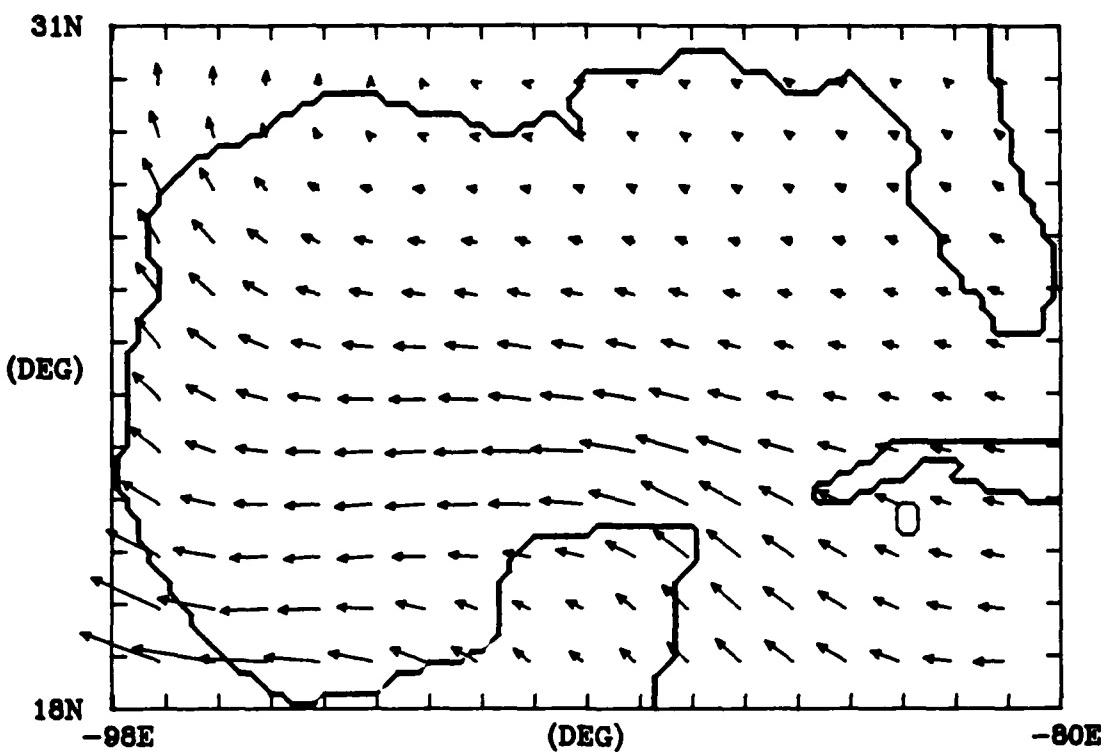
-80E

MIN = -9.71E-07 MAX = 3.72E-07

NODA 323 13-DEC-84

WIND STRESS
AUGUST 1967-1982

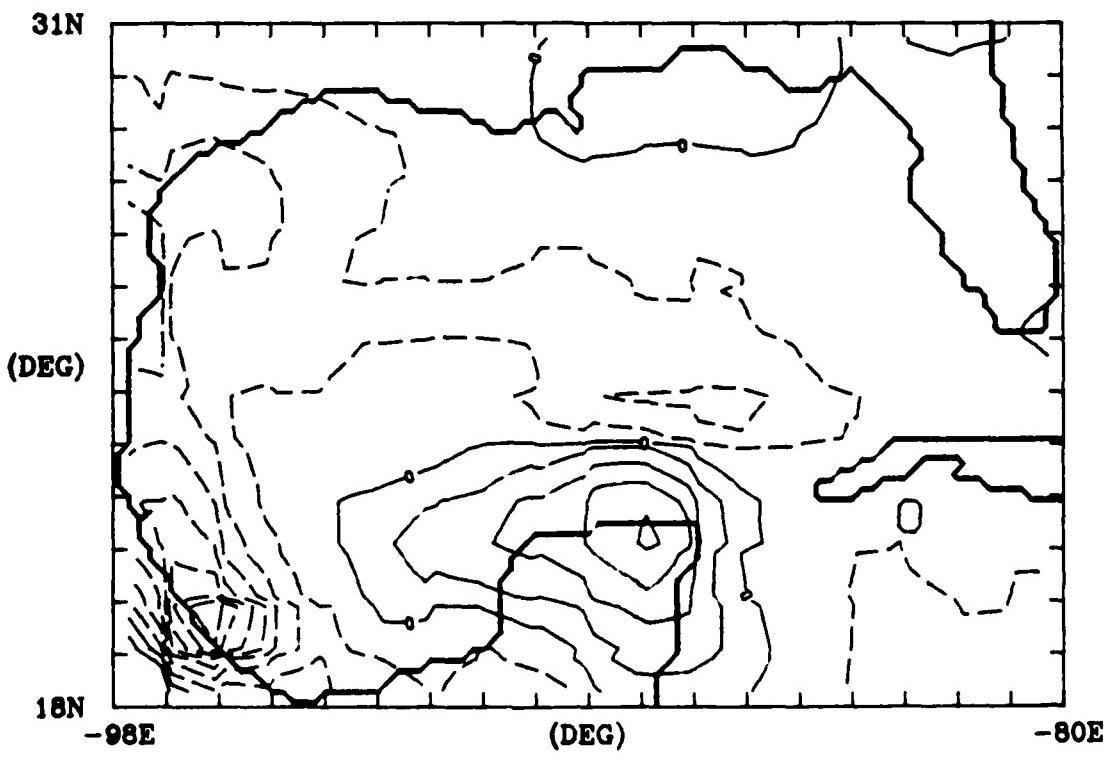
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MAXIMUM WIND STRESS = 1.28 DYNES/CM²

NODA 323 19-DEC-84

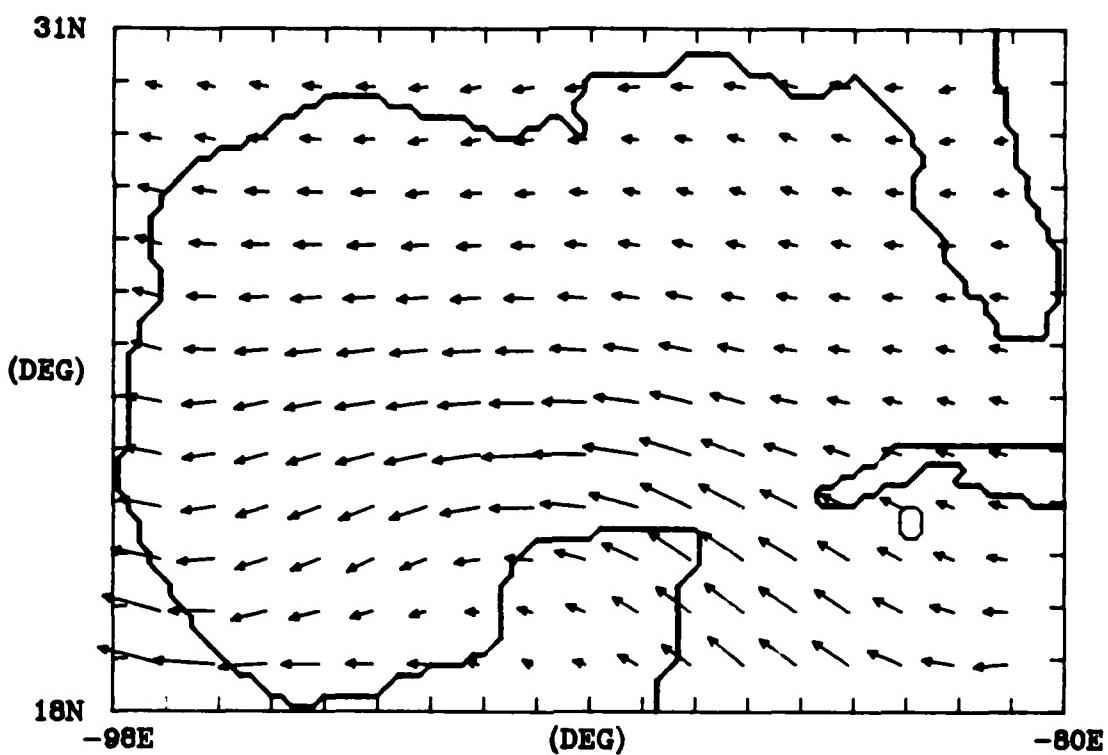
WIND STRESS CURL
AUGUST 1967-1982 DC = 1.0E-07



MIN = -8.08E-07 MAX = 4.28E-07

NODA 323 19-DEC-84

WIND STRESS
SEPTEMBER 1967-1982

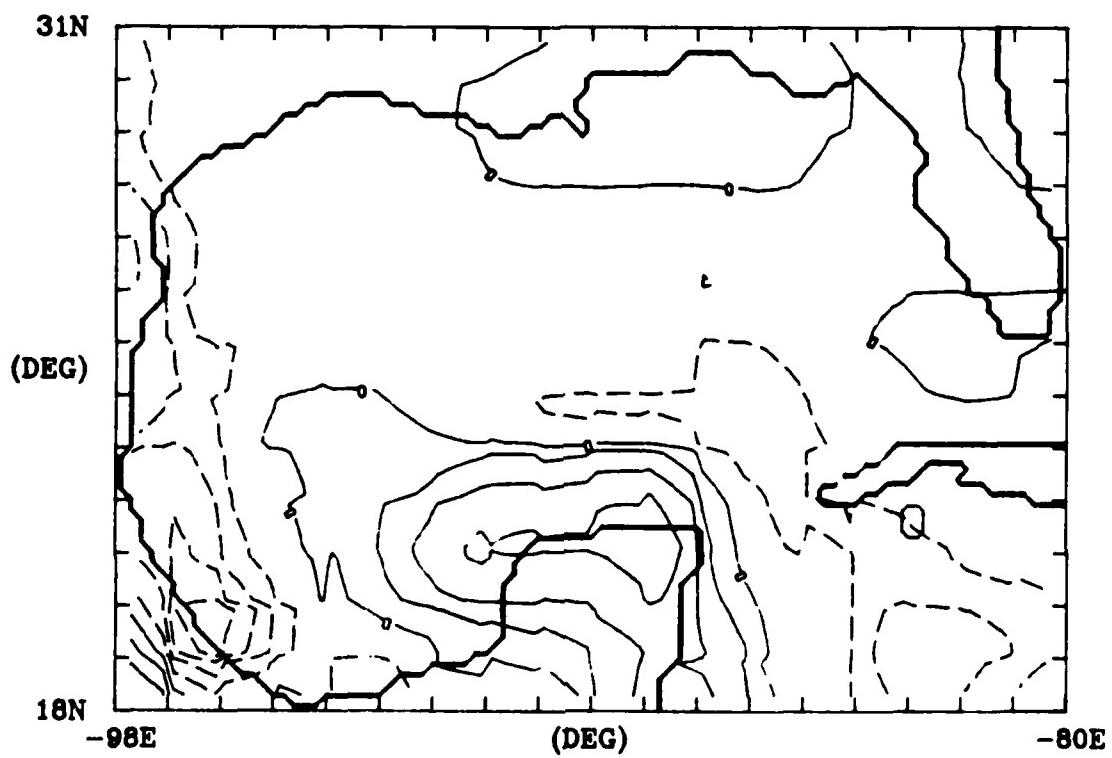


MAXIMUM WIND STRESS = 0.98 DYNES/CM²

MORDA 223 13-DEC-84

WIND STRESS CURL

SEPTEMBER 1967-1982 DC = 1.0E-07



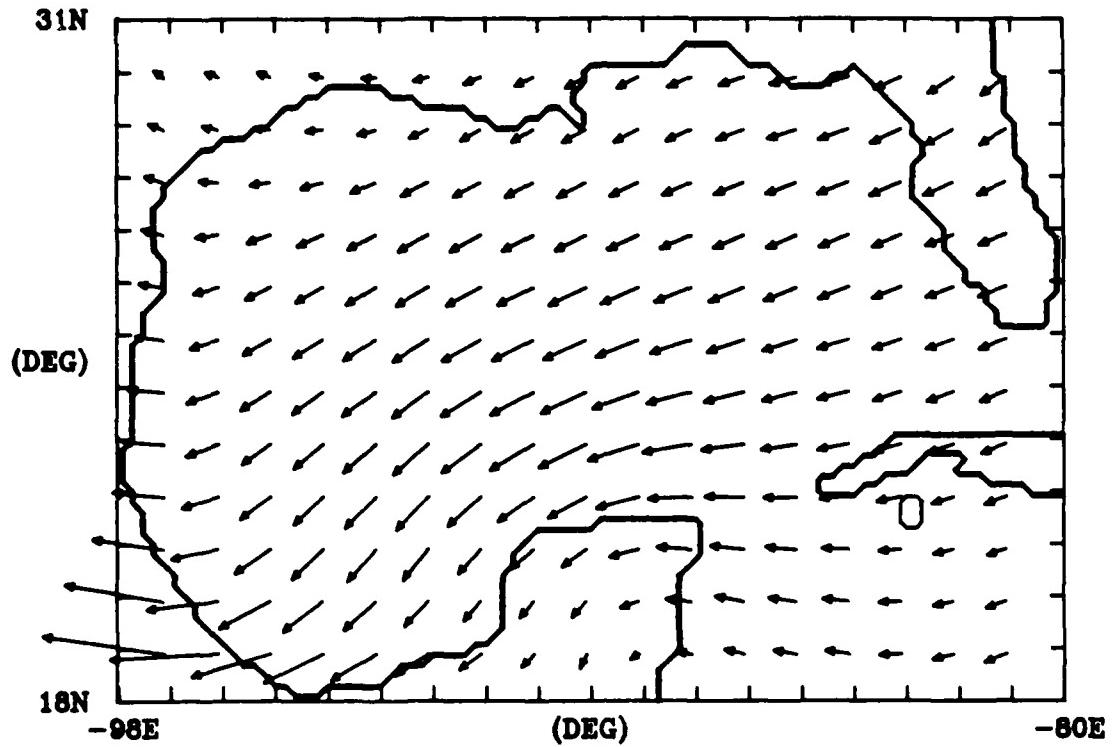
MIN = -5.34E-07 **MAX = 3.83E-07**

MORDA 323 13-DEC-84

WIND STRESS
OCTOBER 1967-1982

10

31N

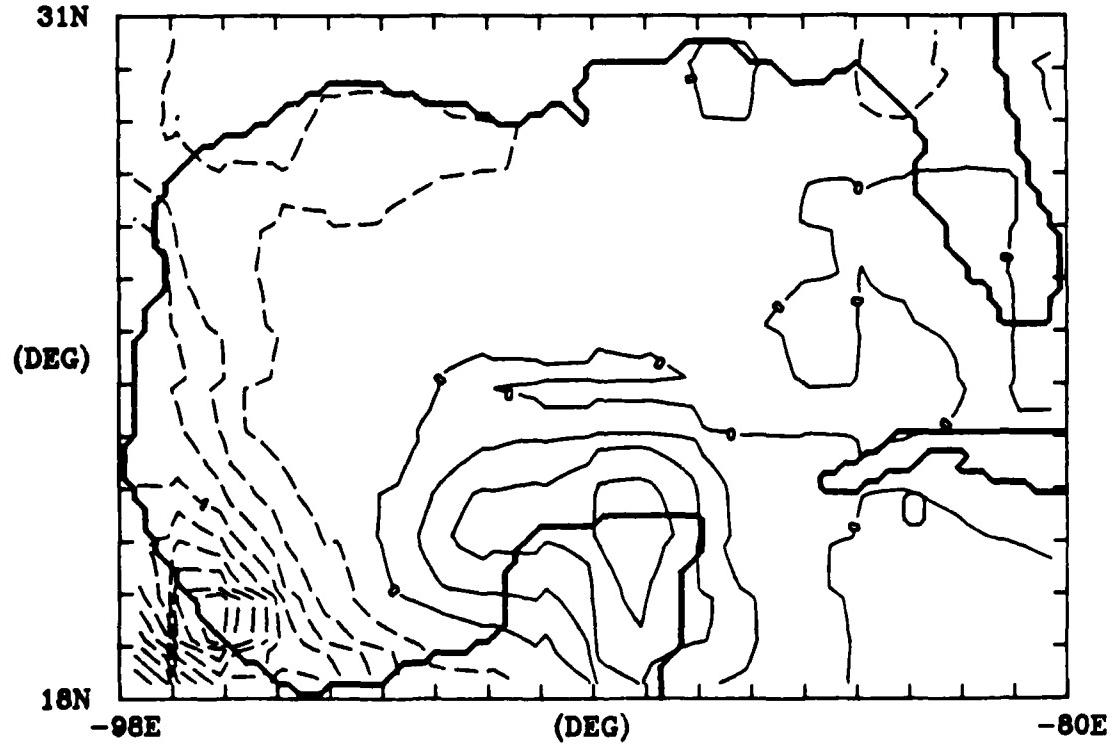


MAXIMUM WIND STRESS = 1.90 DYNES/CM²

NORDA 323 13-DEC-84

WIND STRESS CURL
OCTOBER 1967-1982 DC = 1.0E-07

31N

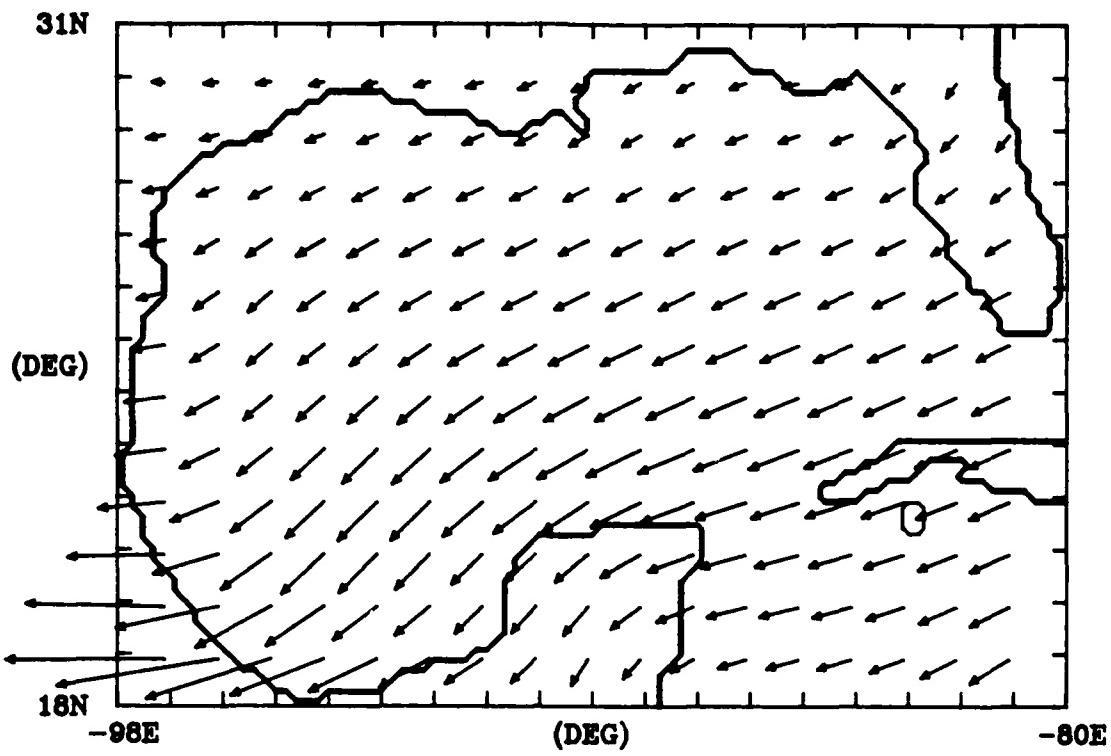


MIN = -9.88E-07 MAX = 3.59E-07

NORDA 323 13-DEC-84

WIND STRESS
NOVEMBER 1967-1982

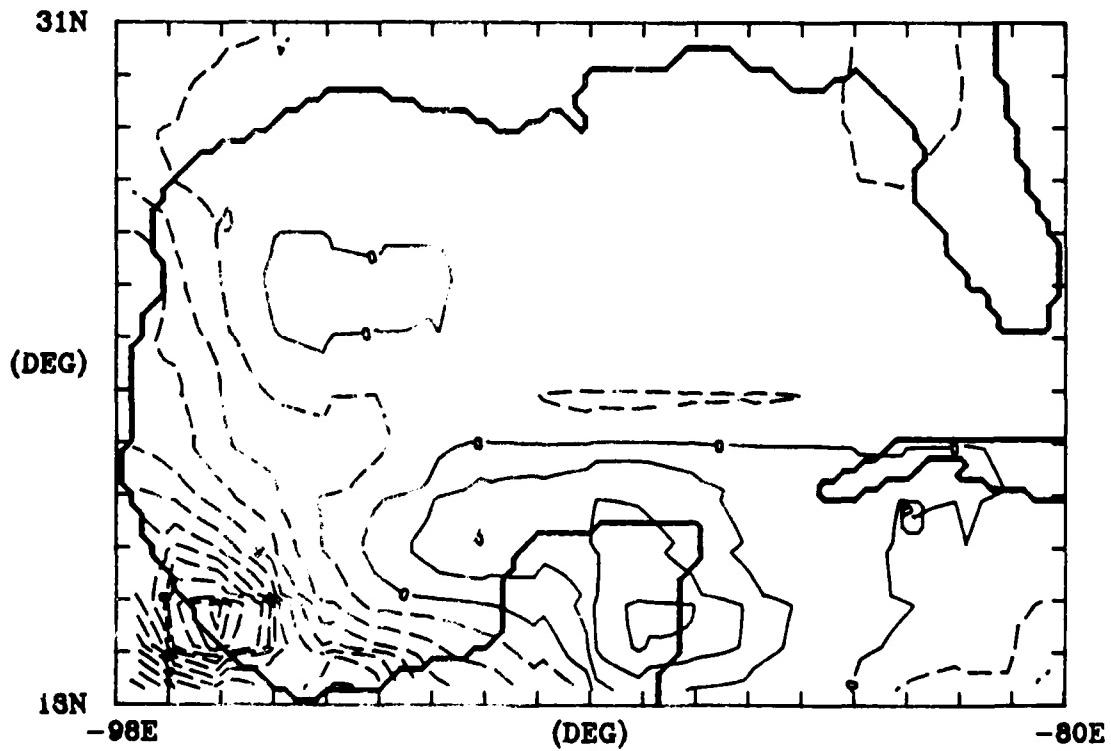
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MAXIMUM WIND STRESS = 2.67 DYNES/CM²

NODA 323 13-DEC-84

WIND STRESS CURL
NOVEMBER 1967-1982 DC = 1.0E-07



MIN = -1.34E-06 MAX = 3.29E-07

NODA 323 13-DEC-84

WIND STRESS
DECEMBER 1967-1982

→

31N

(DEG)

18N

-98E

(DEG)

-80E

MAXIMUM WIND STRESS = 2.96 DYNES/CM²

NODA 323 13-DEC-84

WIND STRESS CURL
DECEMBER 1967-1982 DC = 1.0E-07

31N

(DEG)

18N

-98E

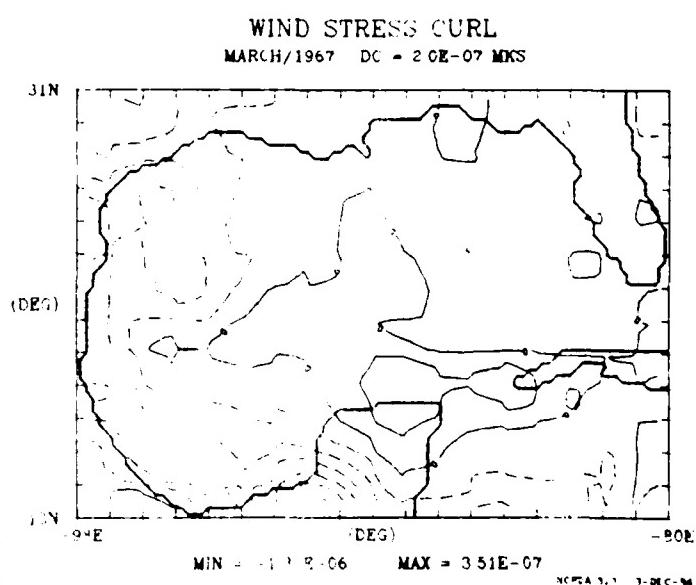
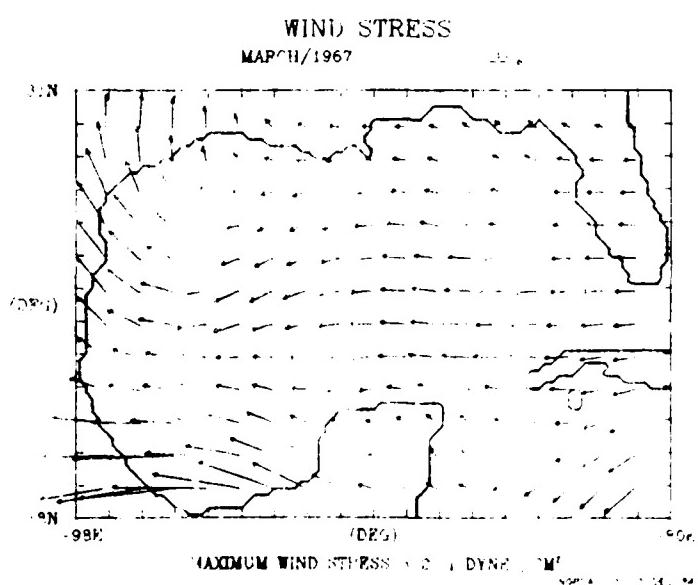
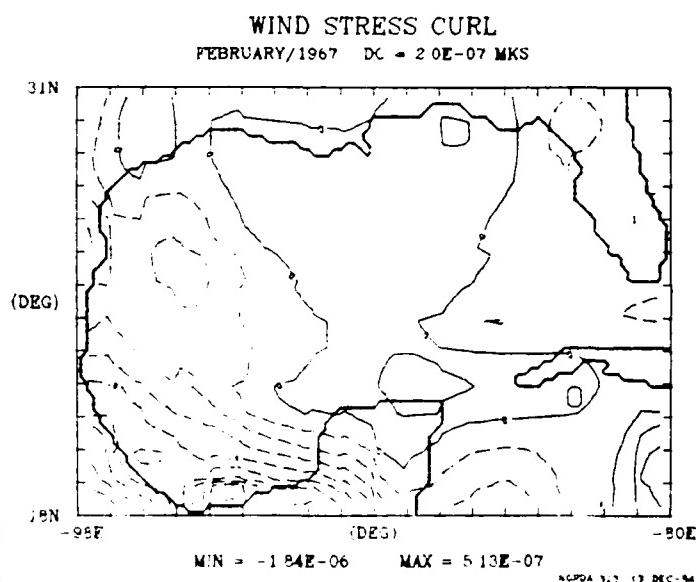
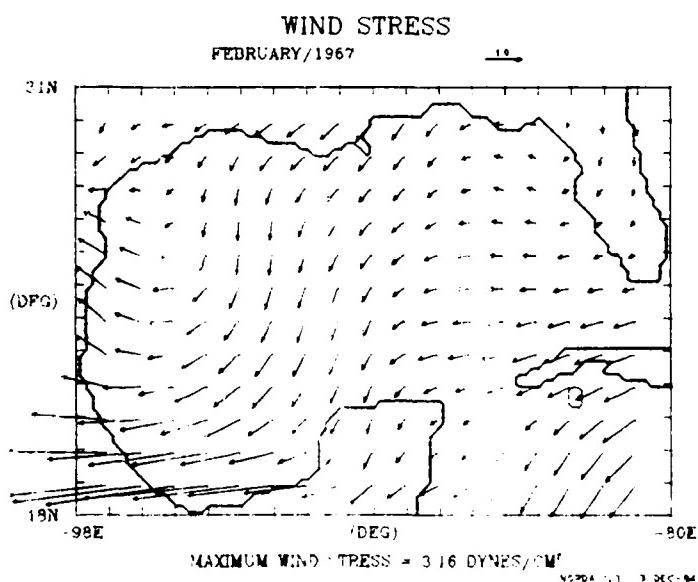
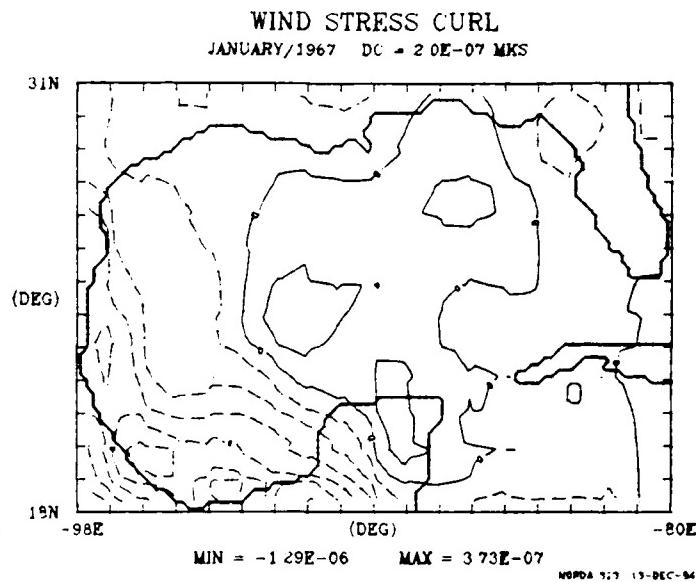
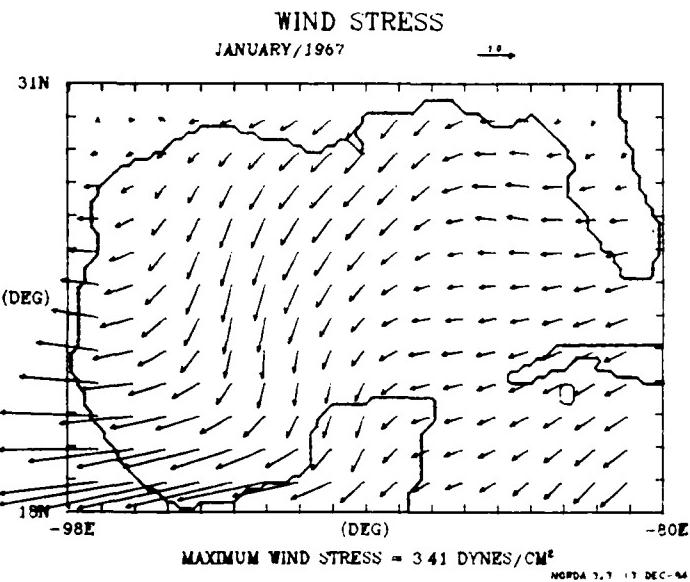
(DEG)

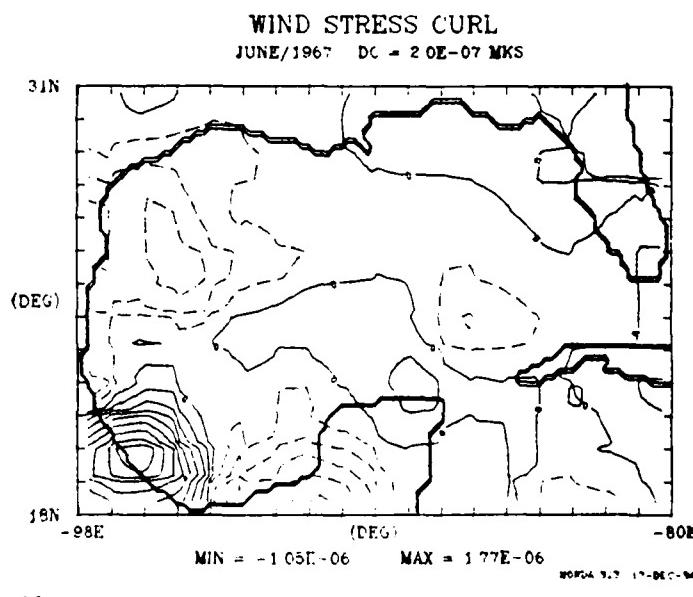
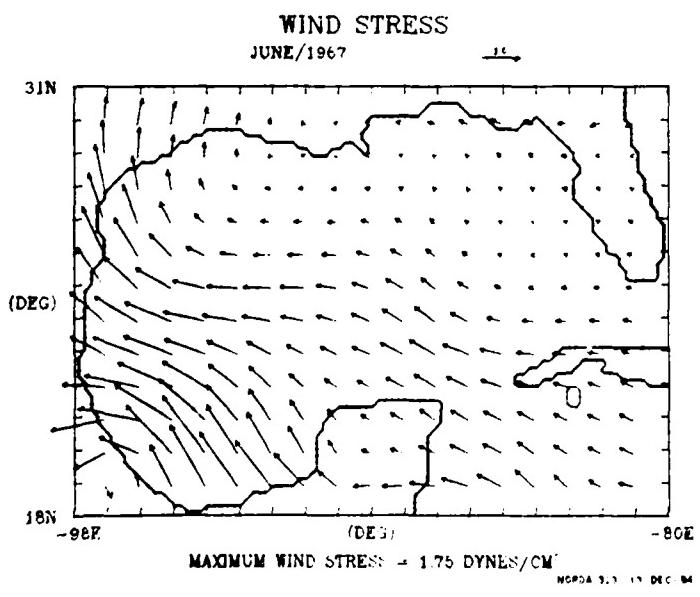
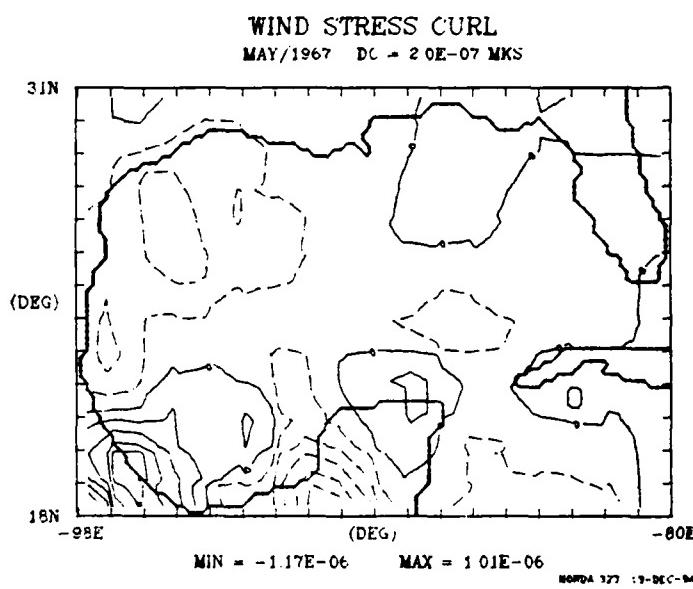
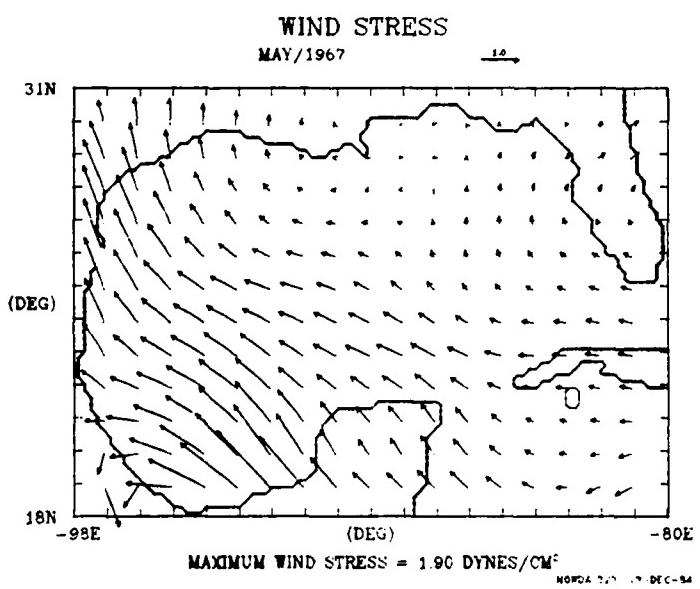
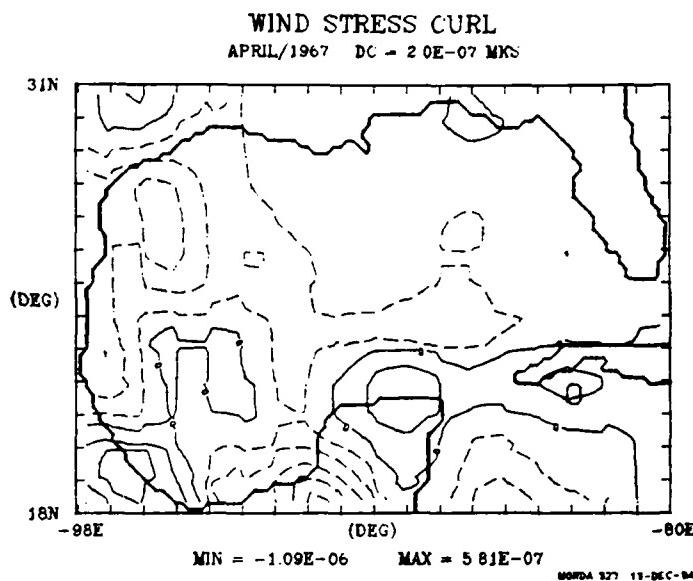
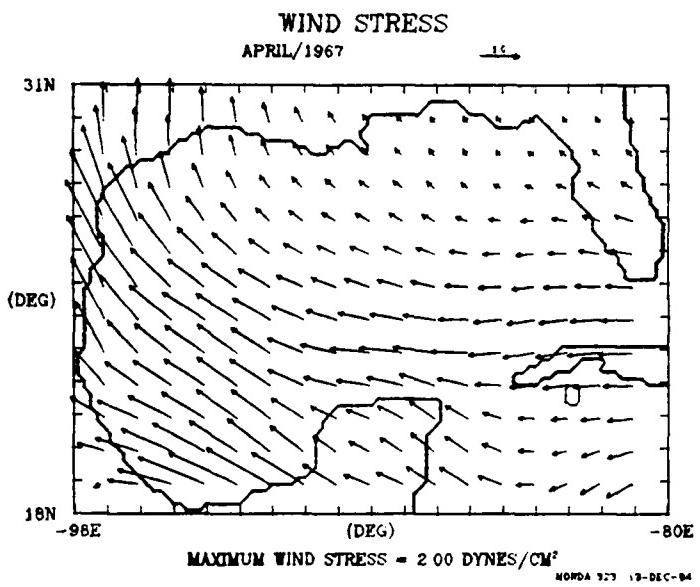
-80E

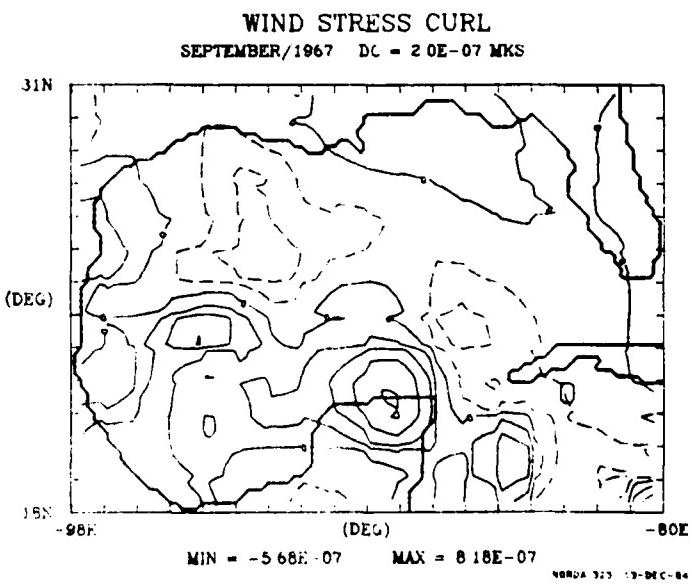
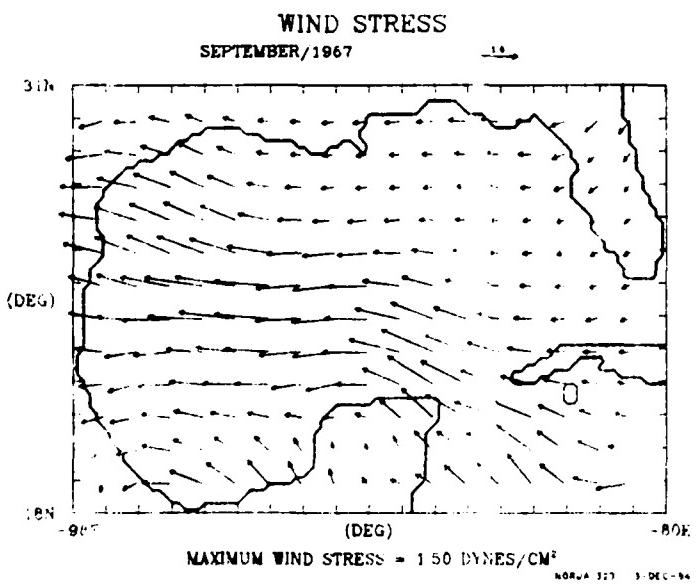
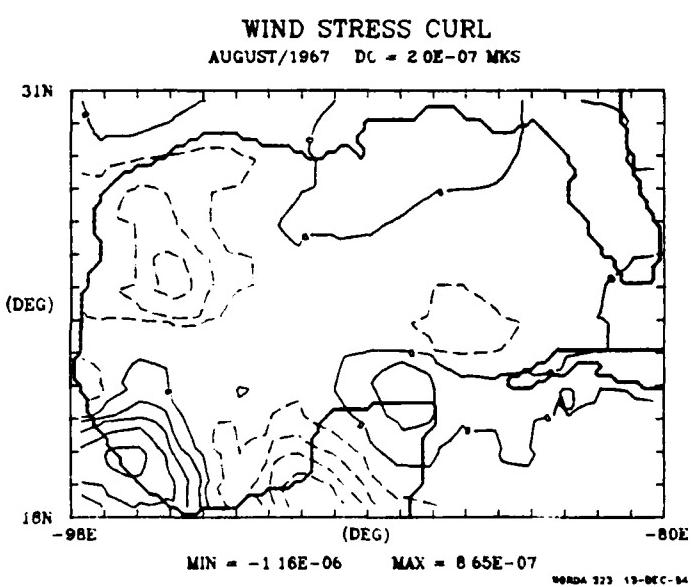
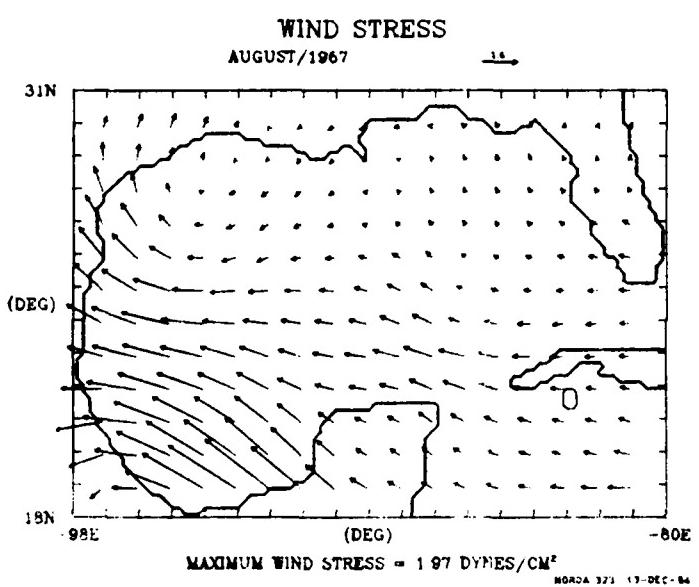
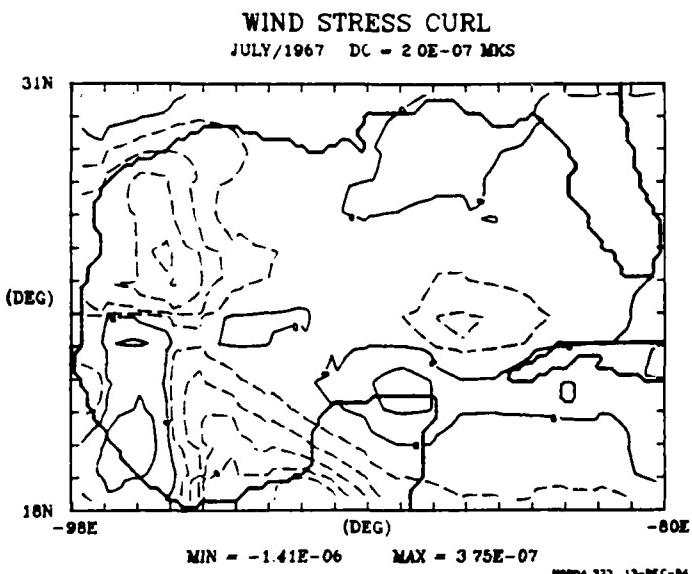
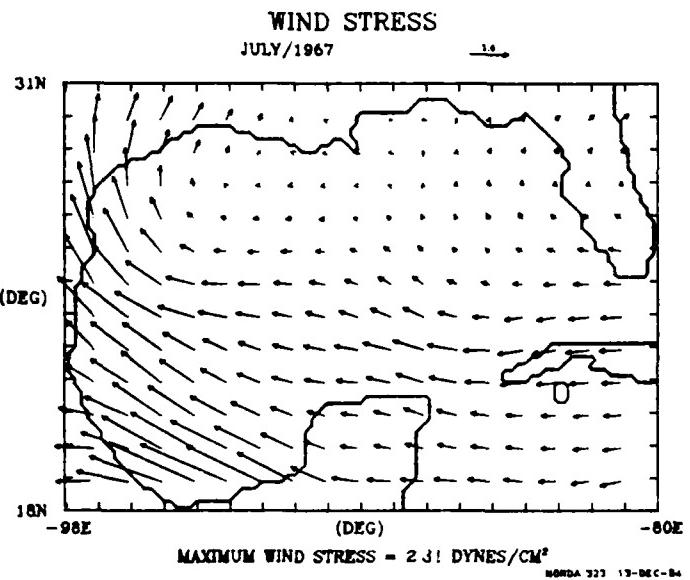
MIN = -1.45E-06 MAX = 2.75E-07

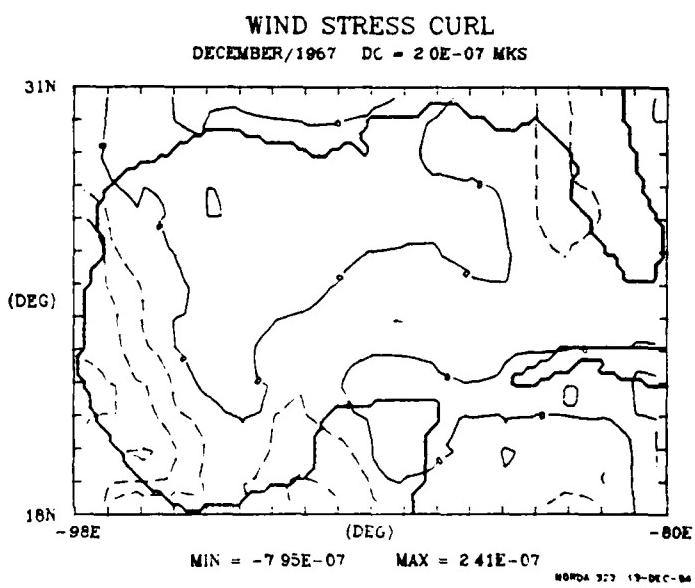
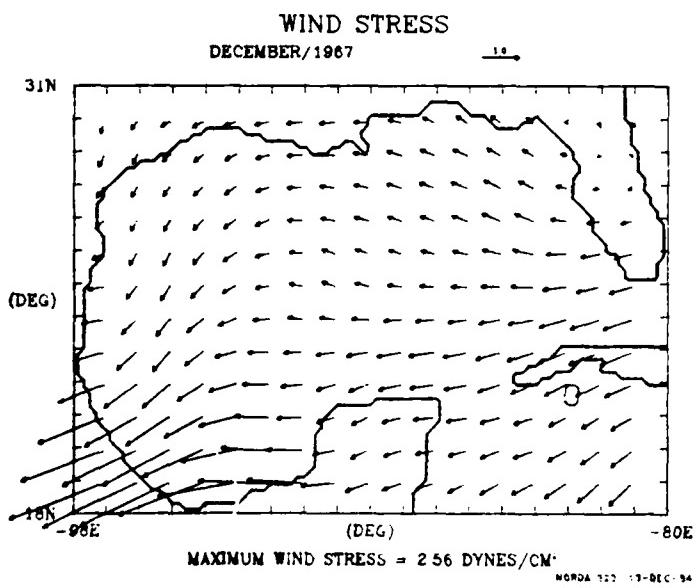
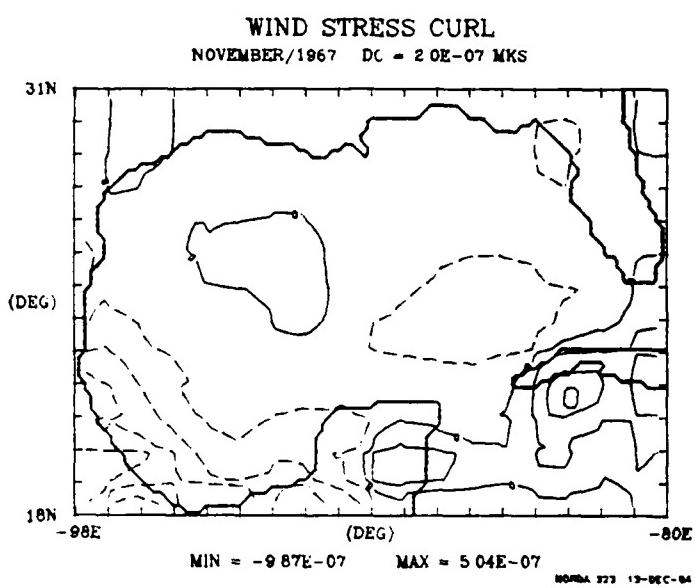
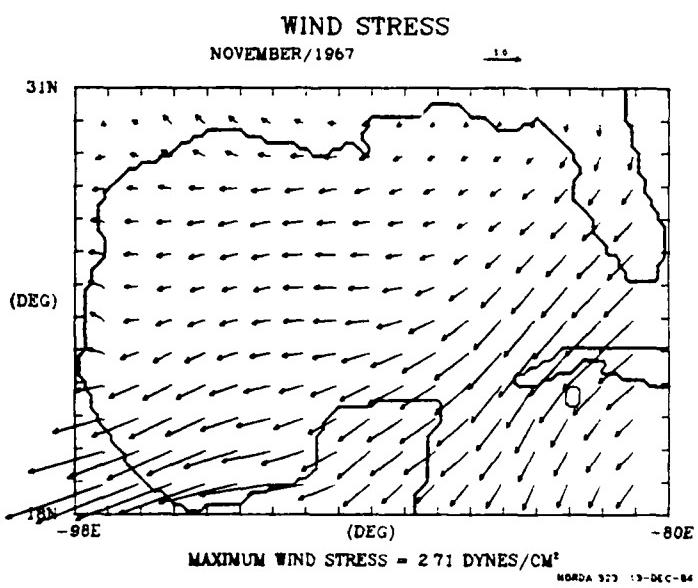
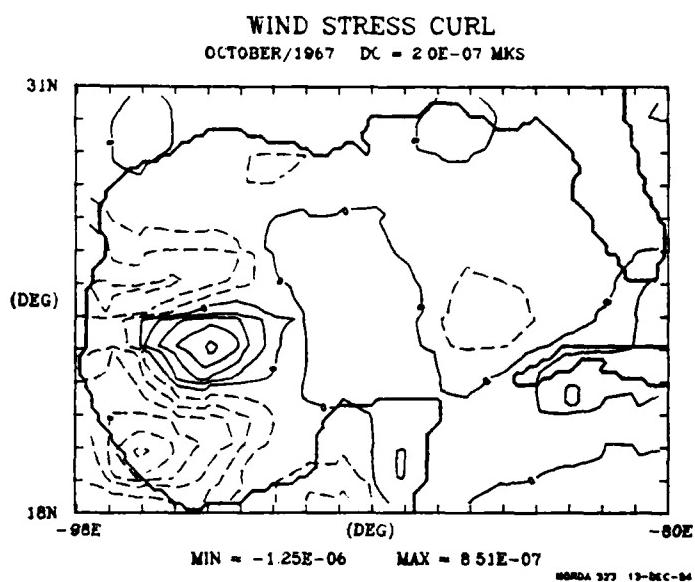
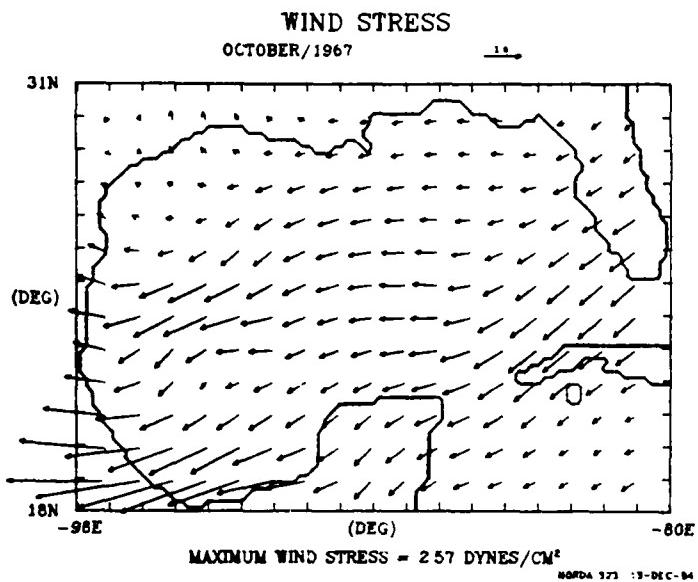
NODA 373 13-DEC-84

APPENDIX D: MONTHLY AVERAGED WIND STRESS AND WIND STRESS CURL
EACH YEAR FROM 1967-1982

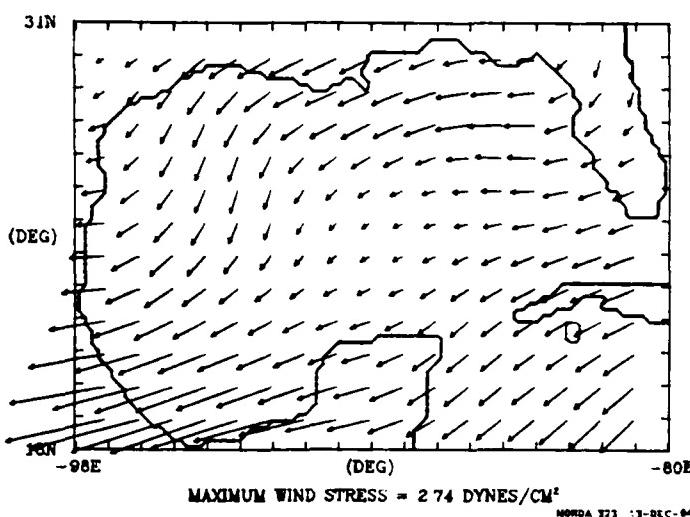




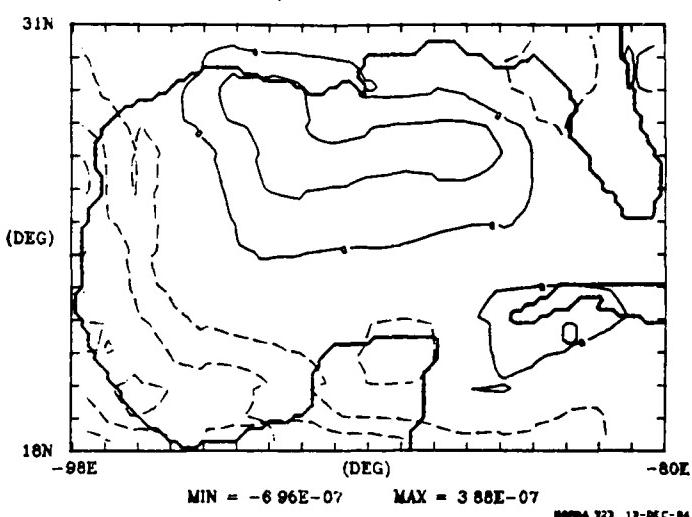




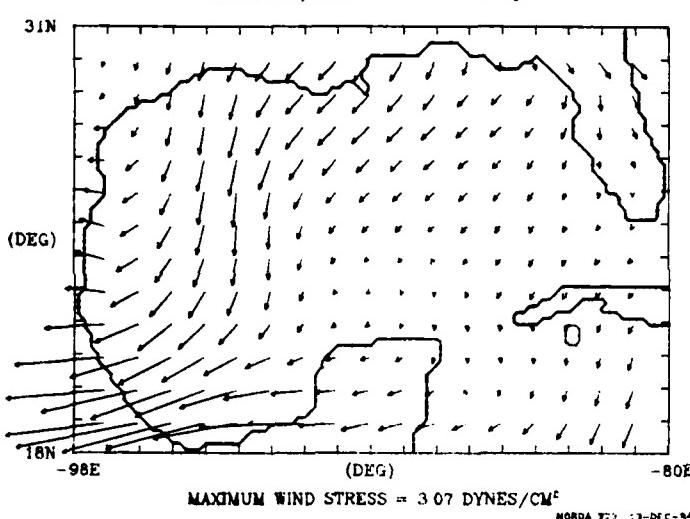
WIND STRESS
JANUARY/1968



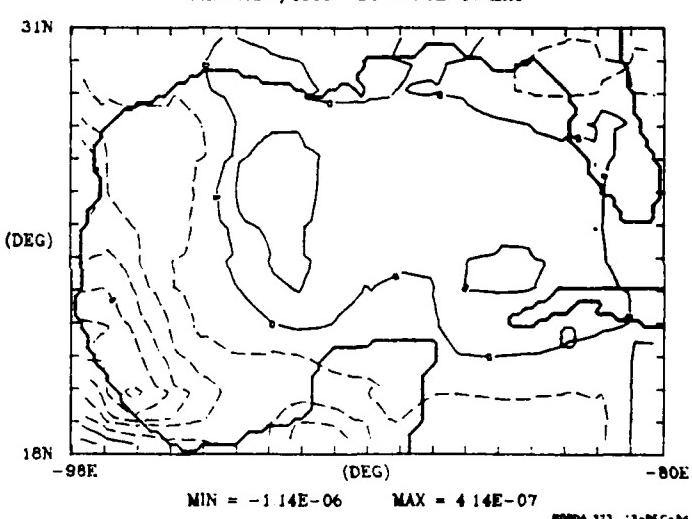
WIND STRESS CURL
JANUARY/1968 DC = 2.0E-07 MKS



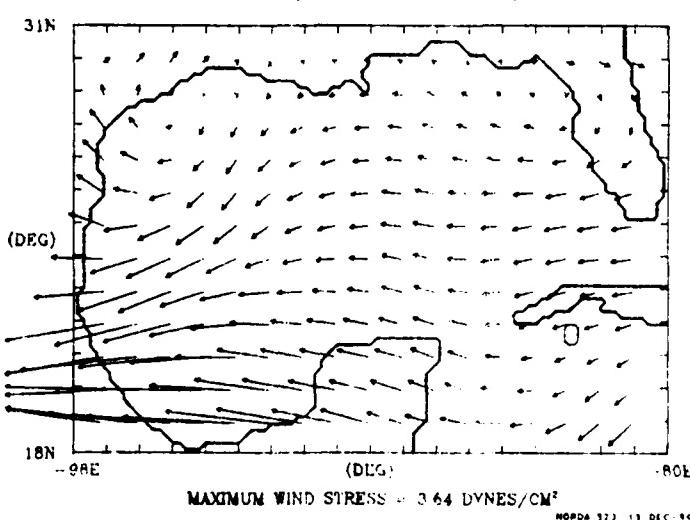
WIND STRESS
FEBRUARY/1968



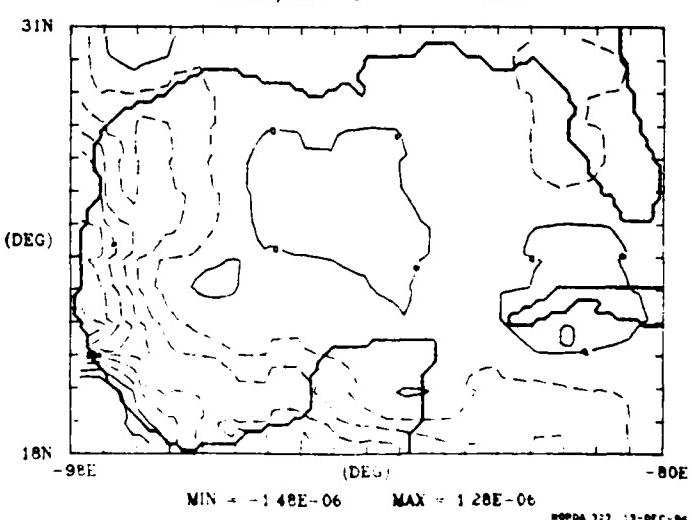
WIND STRESS CURL
FEBRUARY/1968 DC = 2.0E-07 MKS



WIND STRESS
MARCH/1968

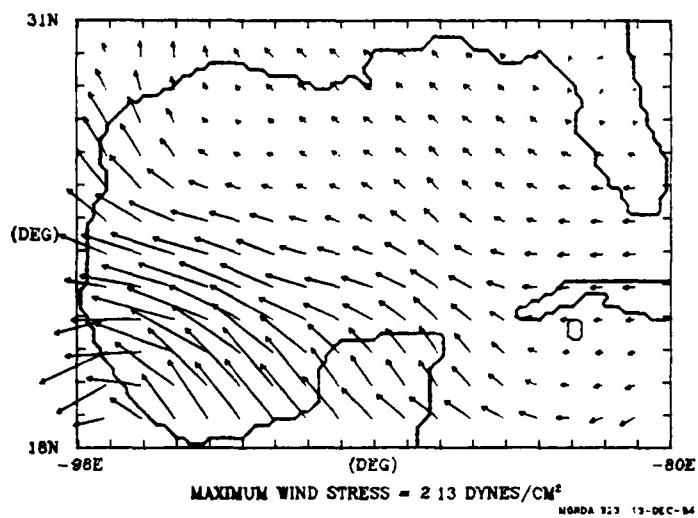


WIND STRESS CURL
MARCH/1968 DC = 2.0E-07 MKS

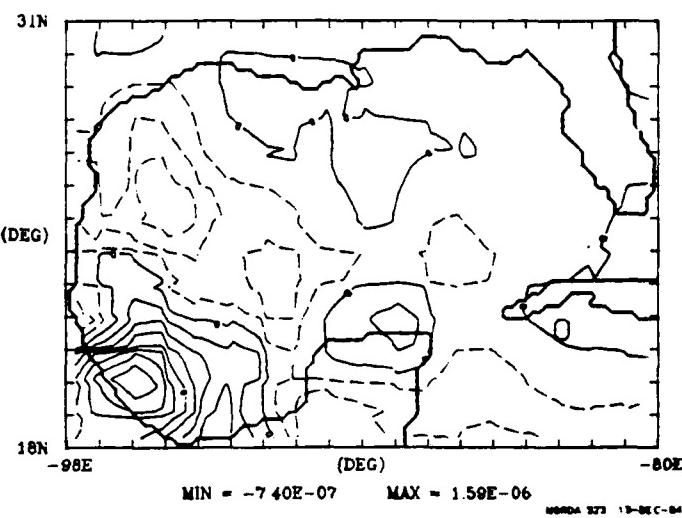


WIND STRESS
APRIL/1968

10

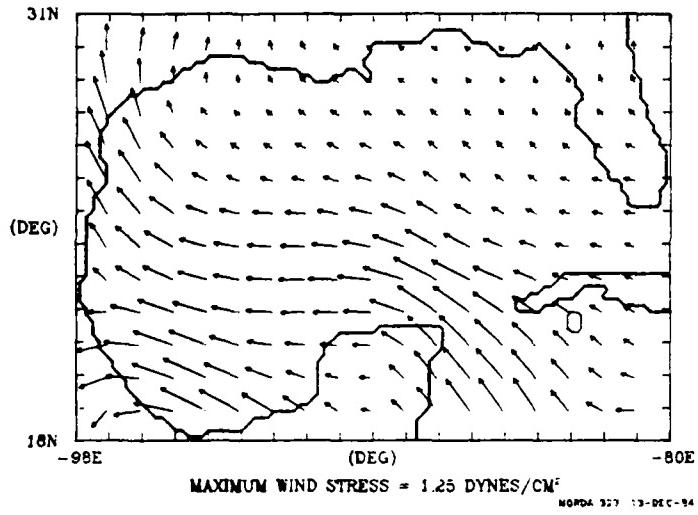


WIND STRESS CURL
APRIL/1968 DC = 2.0E-07 MKS

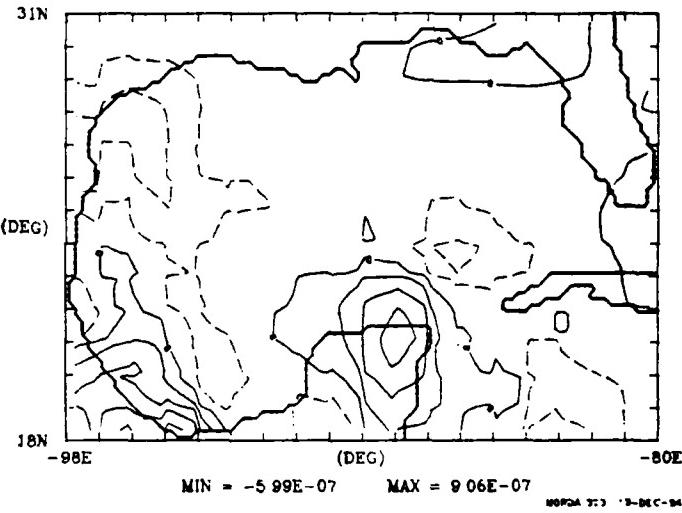


WIND STRESS
MAY/1968

10

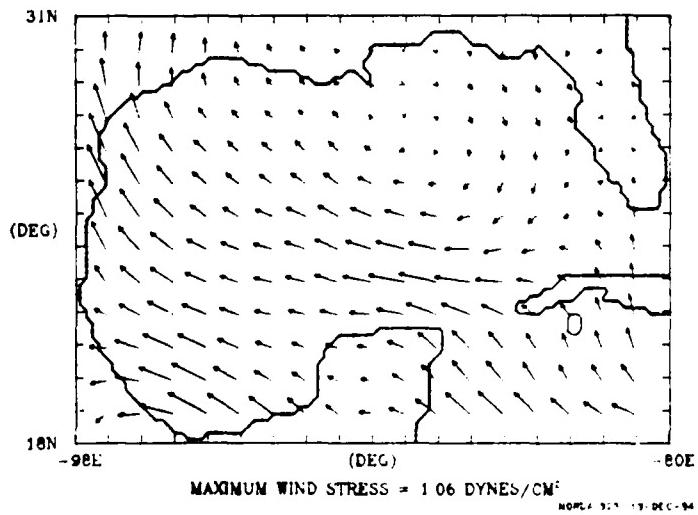


WIND STRESS CURL
MAY/1968 DC = 2.0E-07 MKS

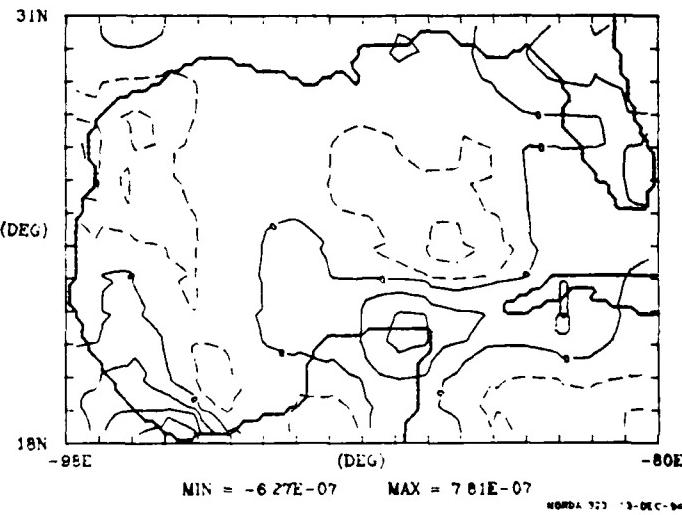


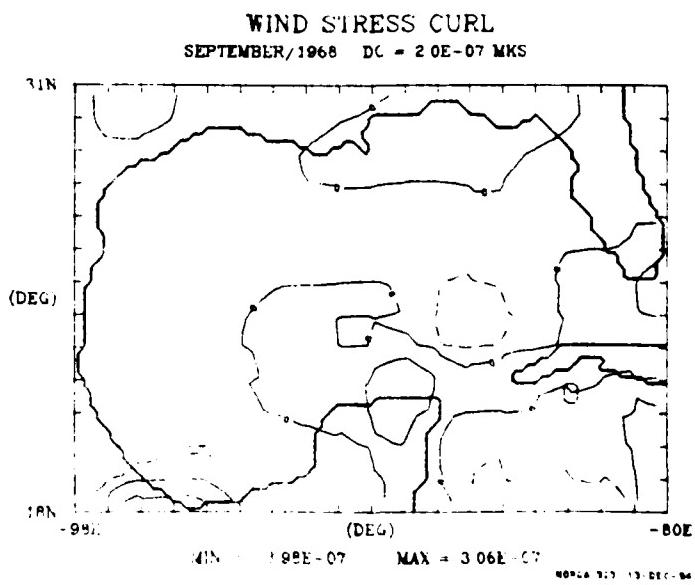
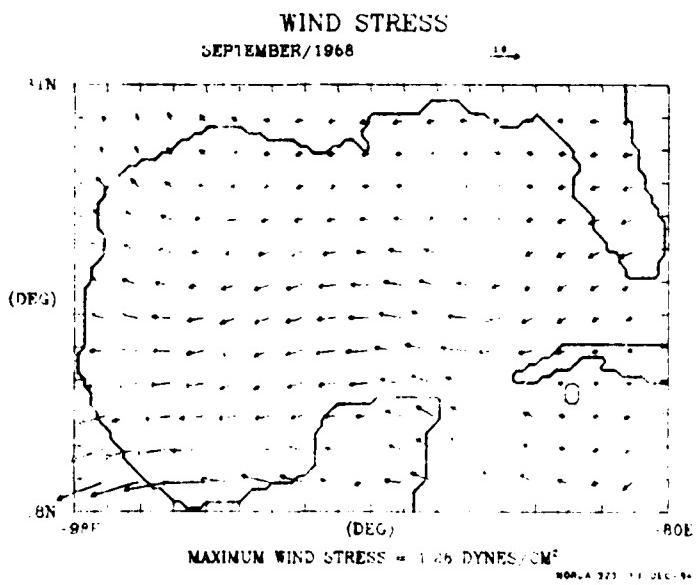
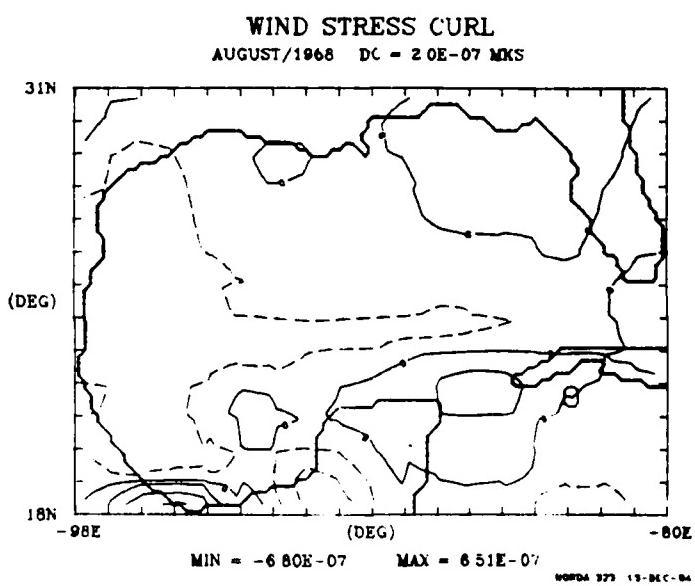
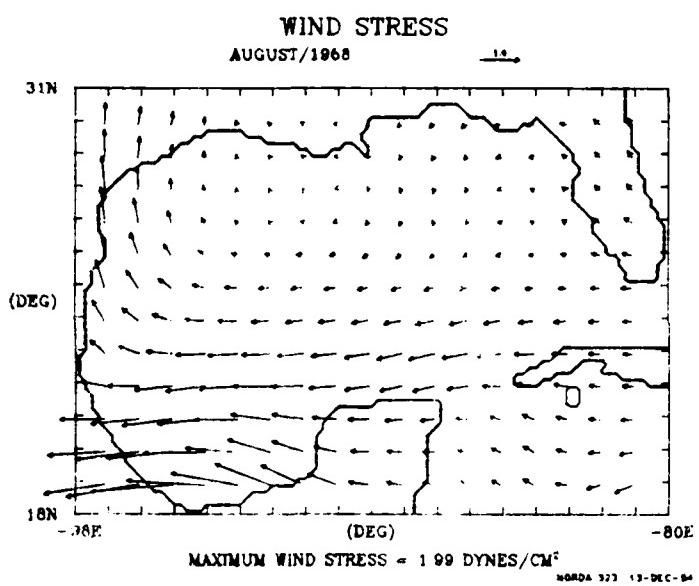
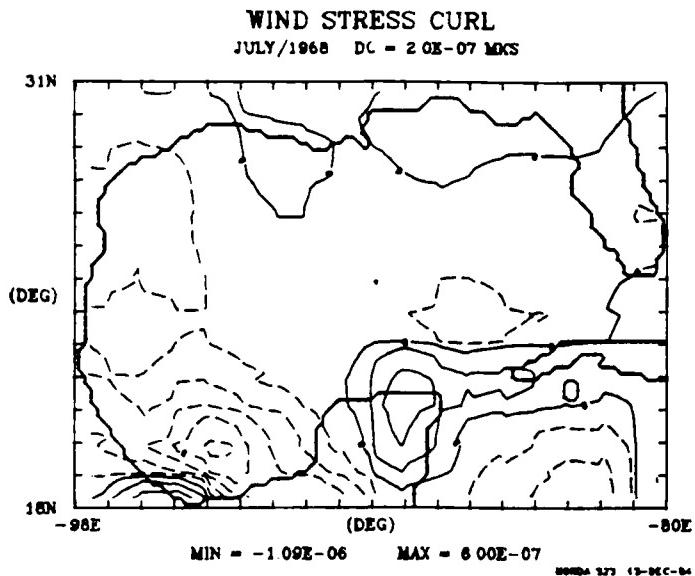
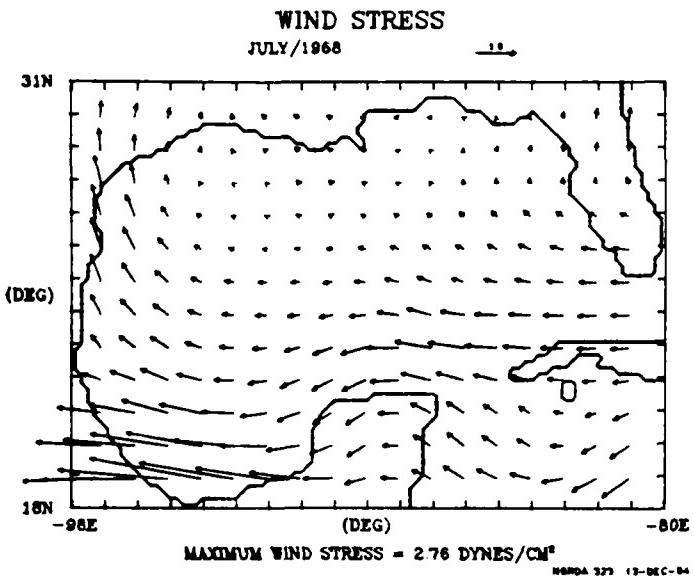
WIND STRESS
JUNE/1968

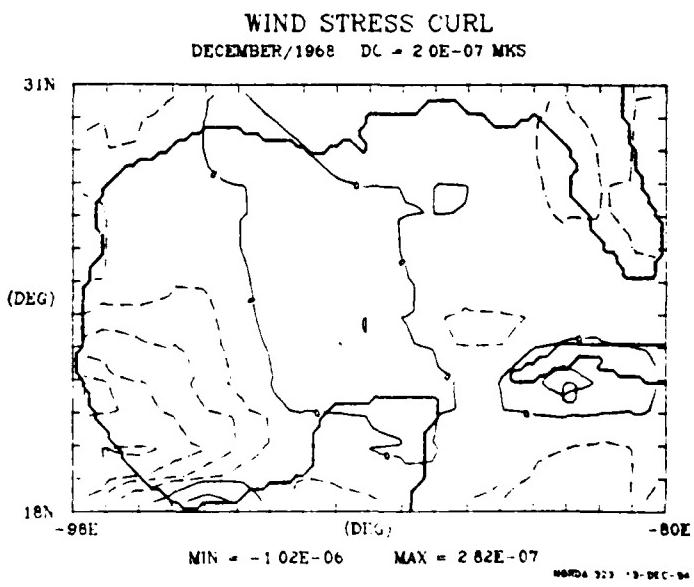
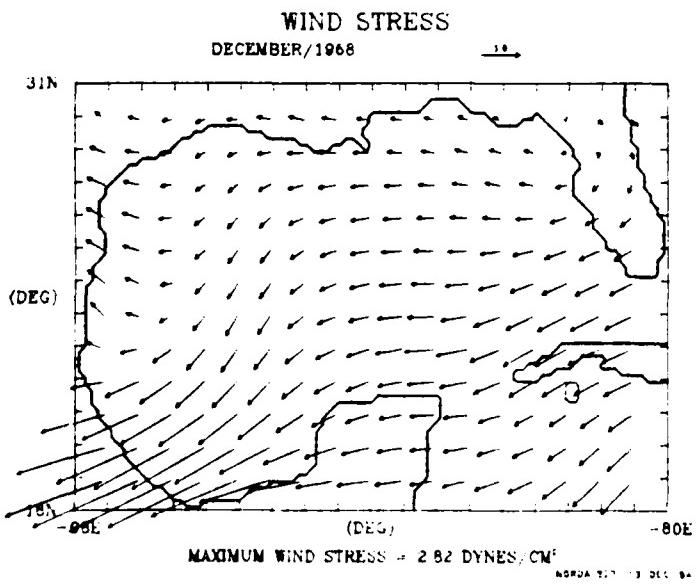
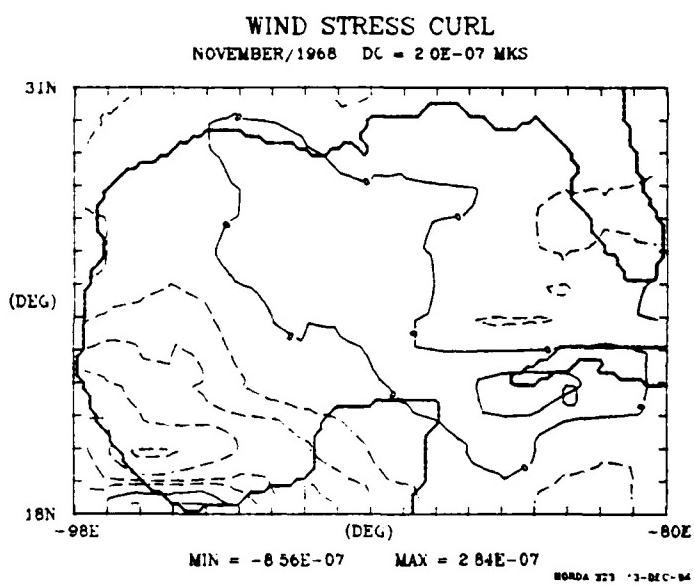
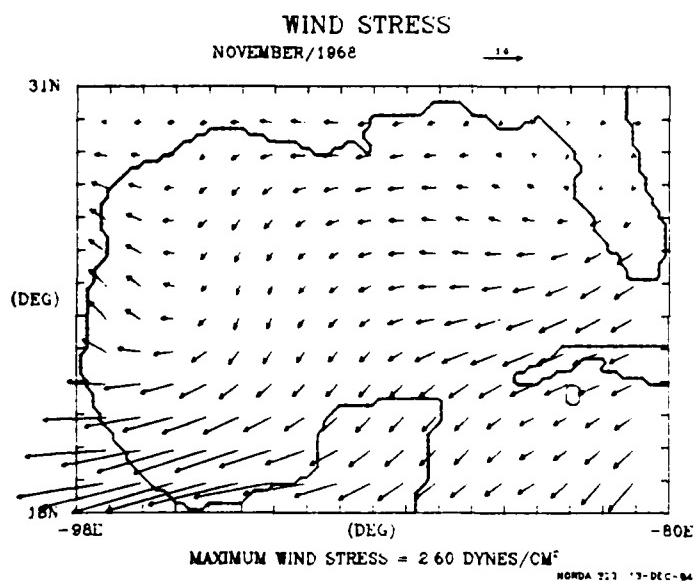
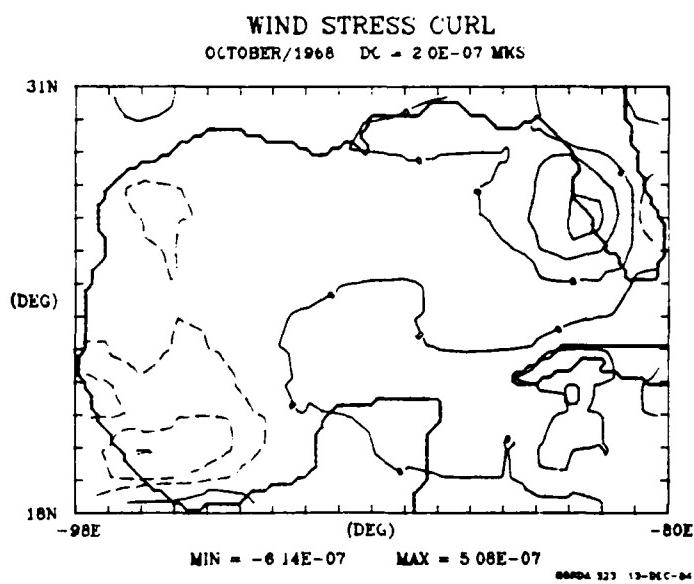
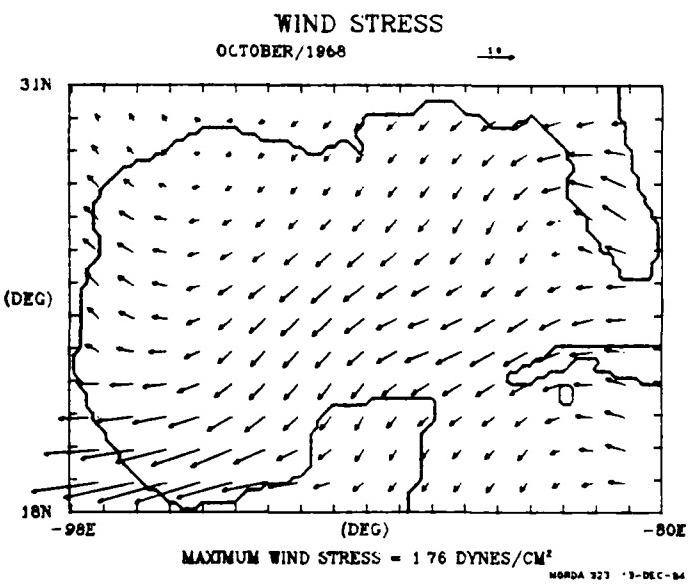
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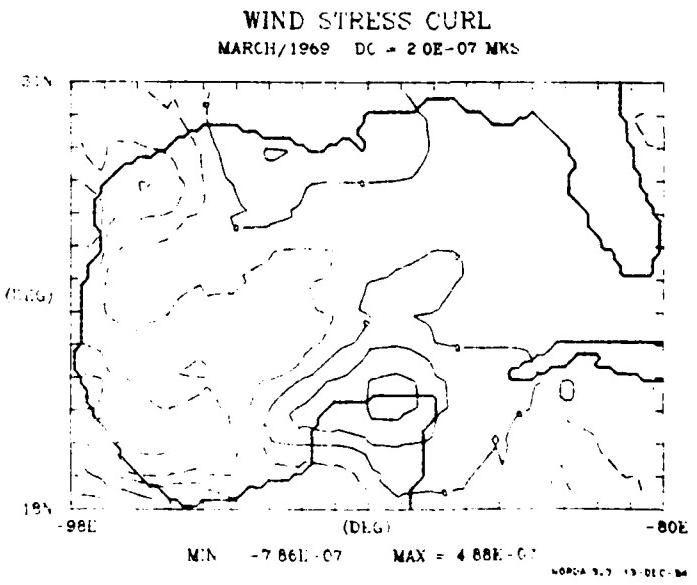
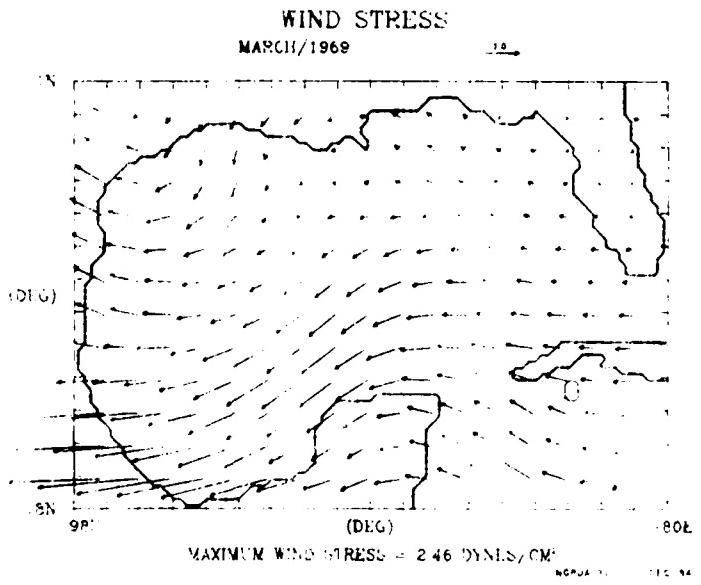
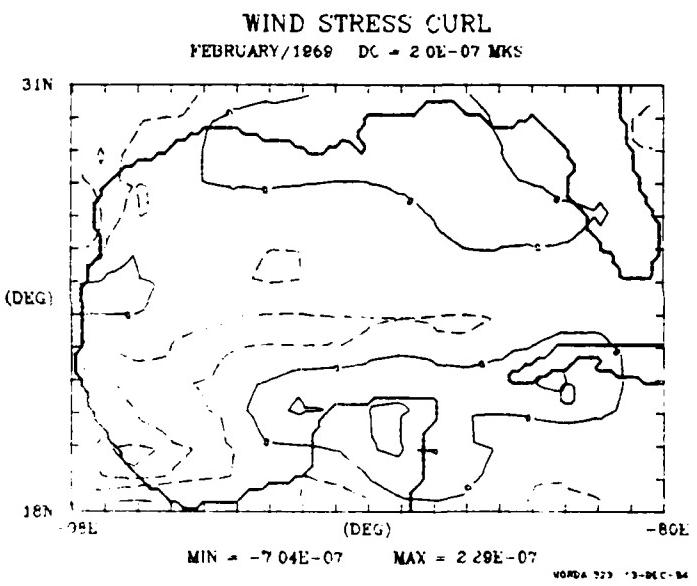
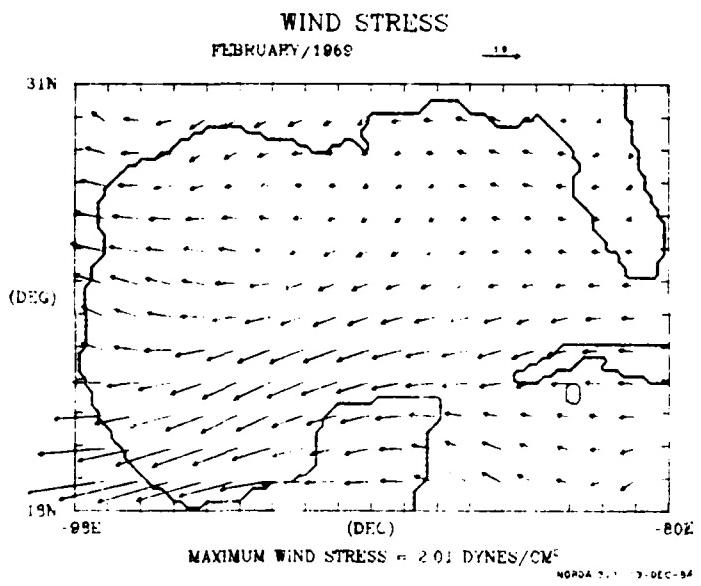
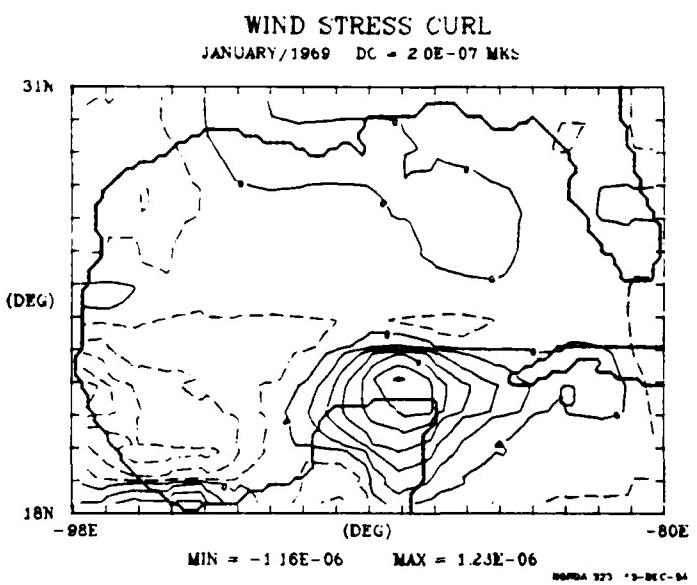
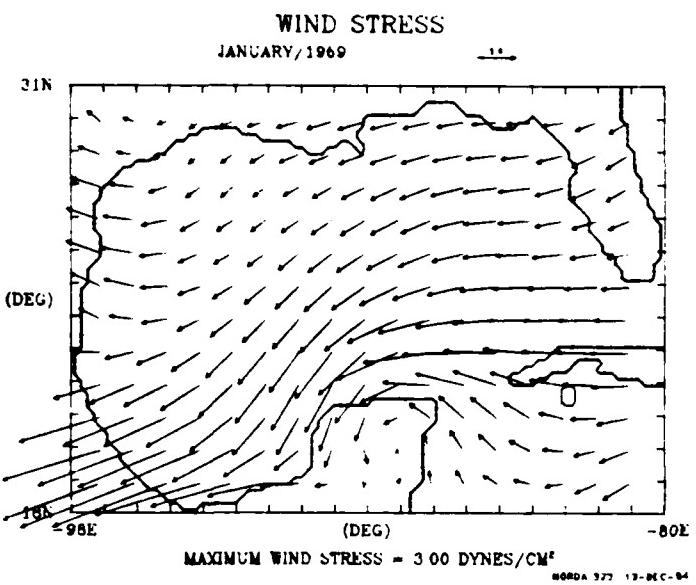


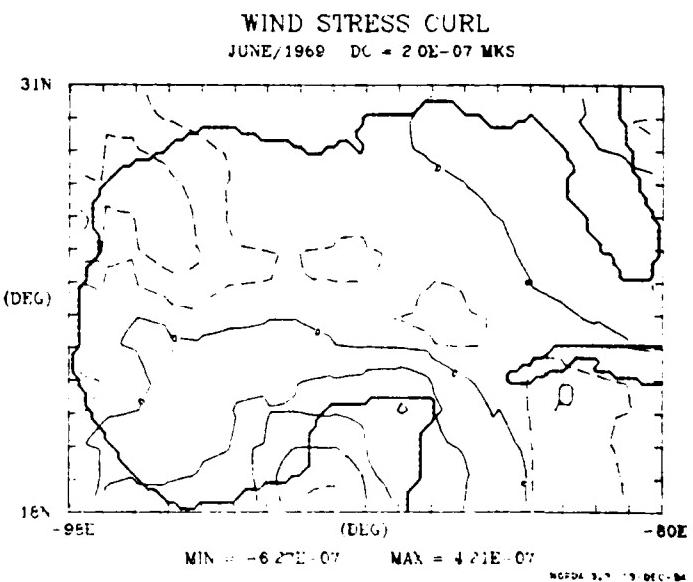
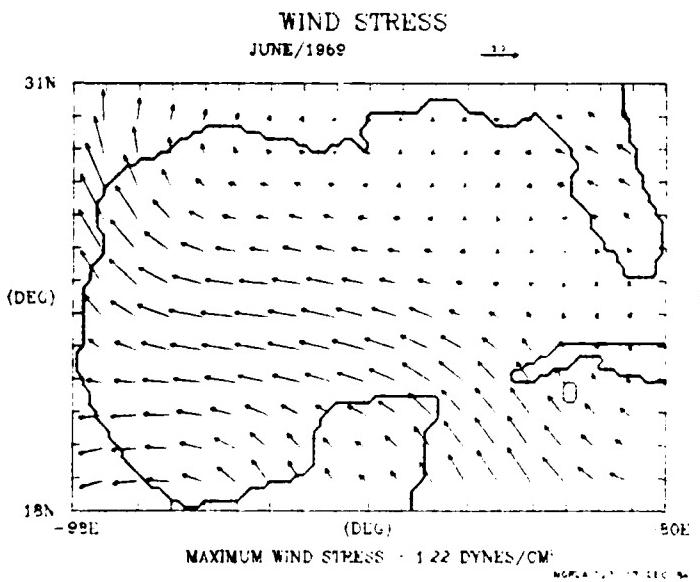
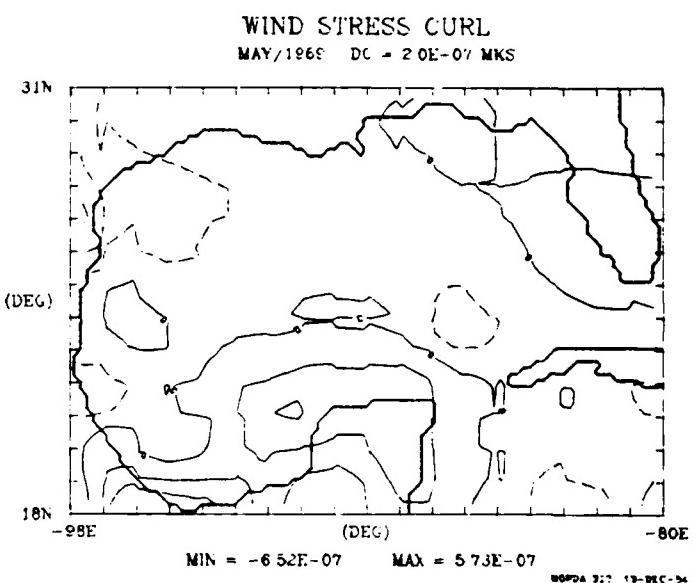
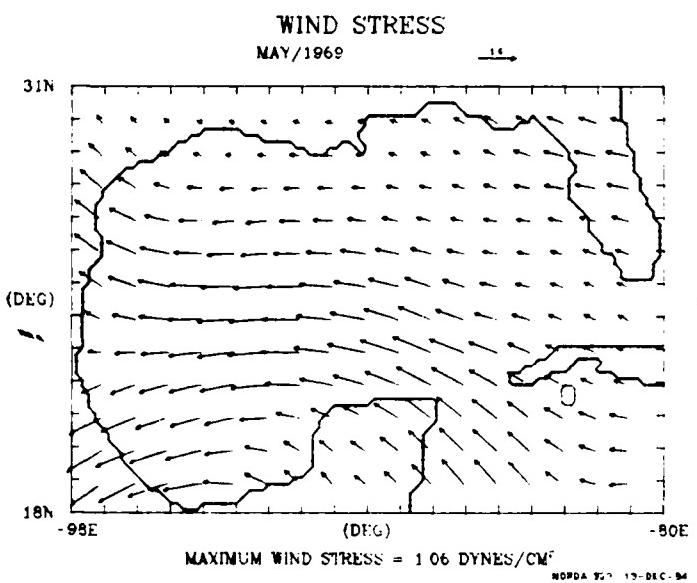
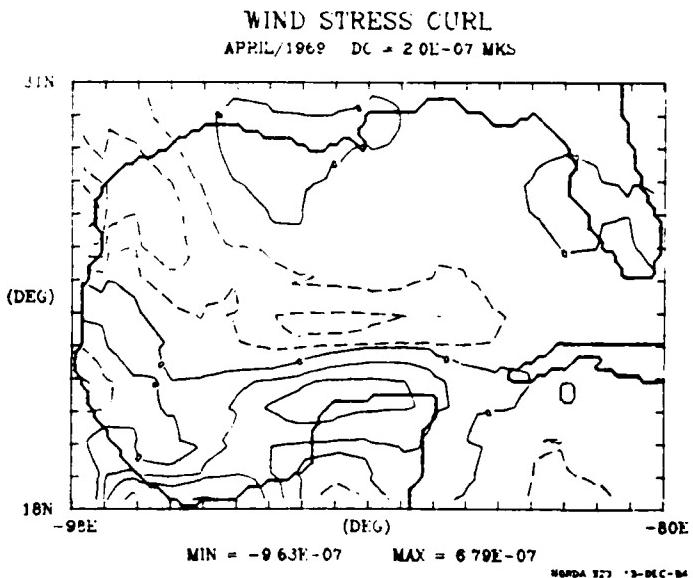
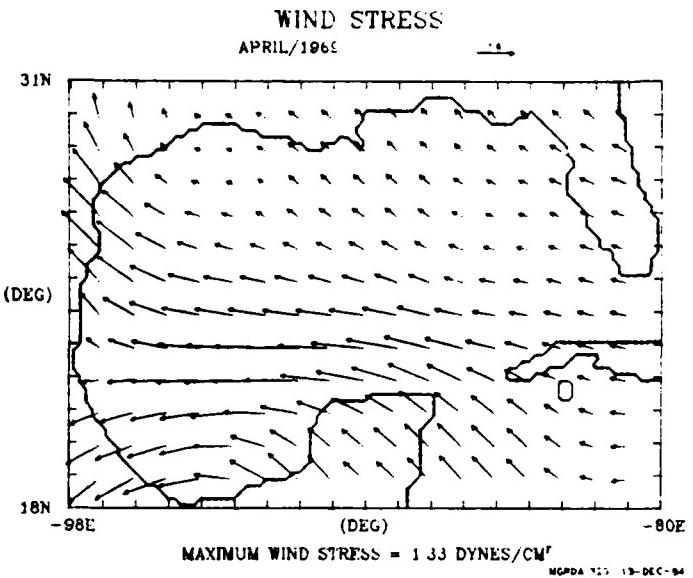
WIND STRESS CURL
JUNE/1968 DC = 2.0E-07 MKS

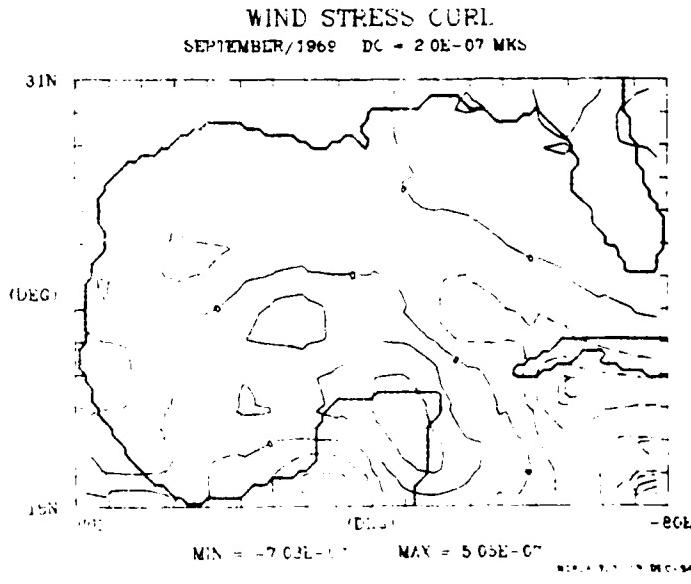
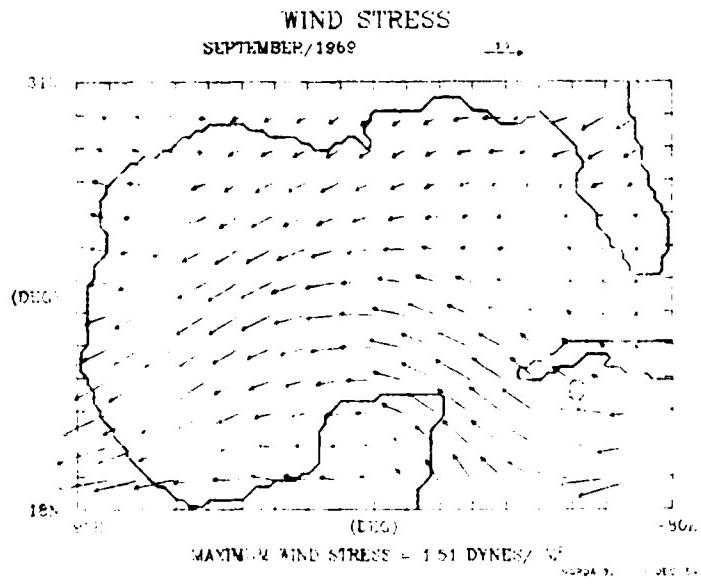
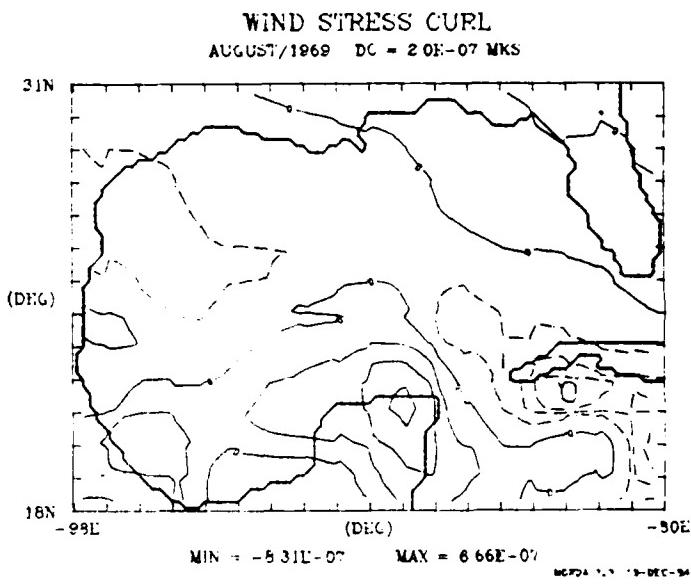
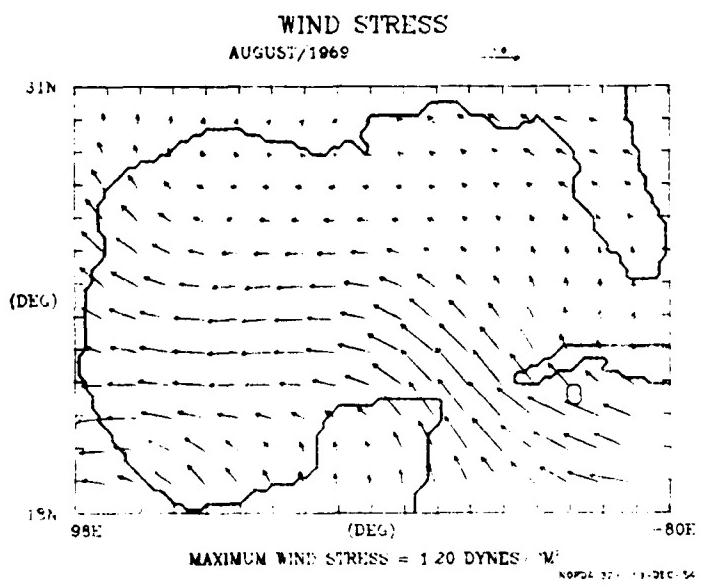
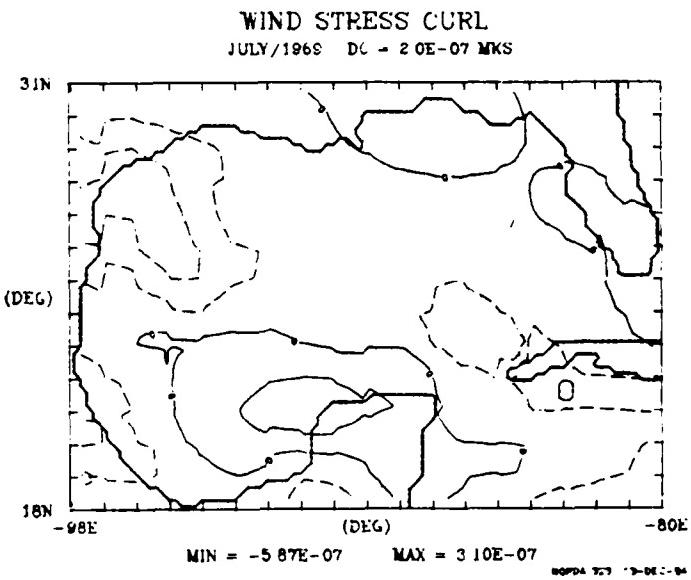
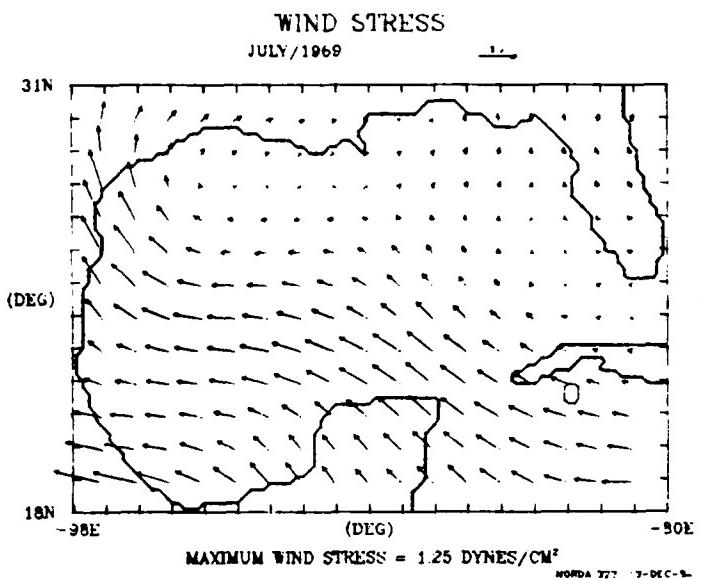




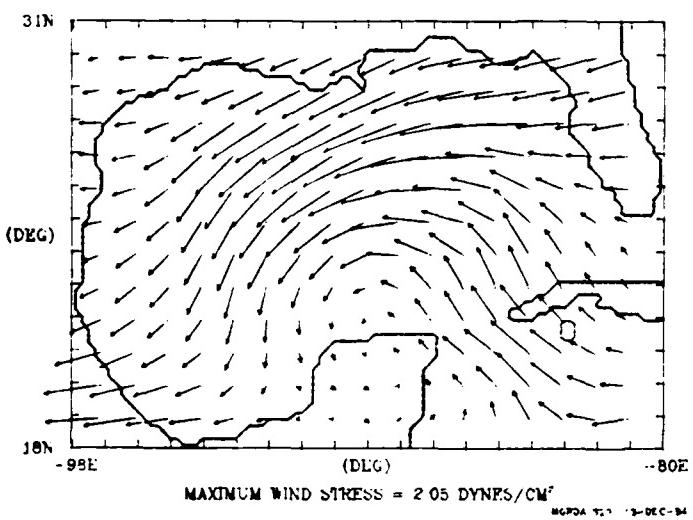




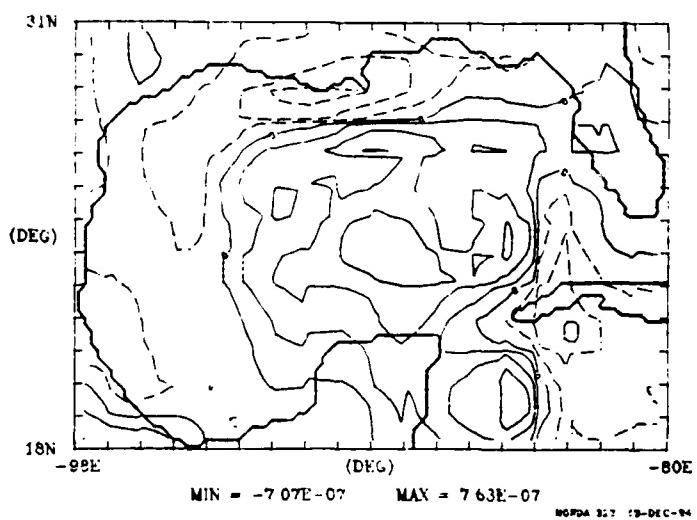




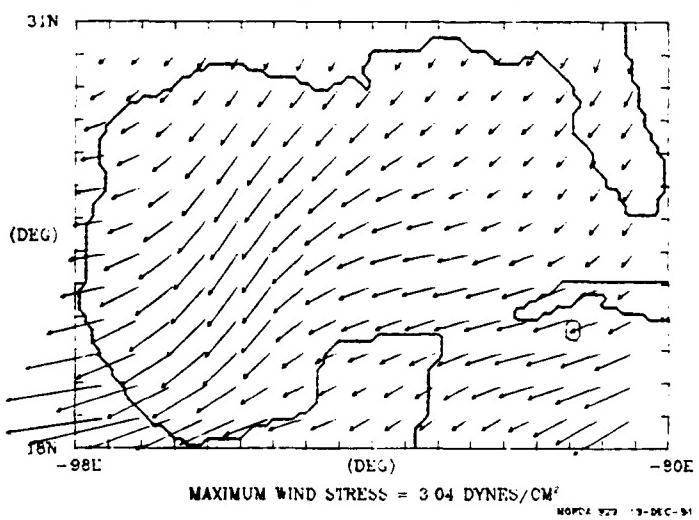
WIND STRESS
OCTOBER/1969



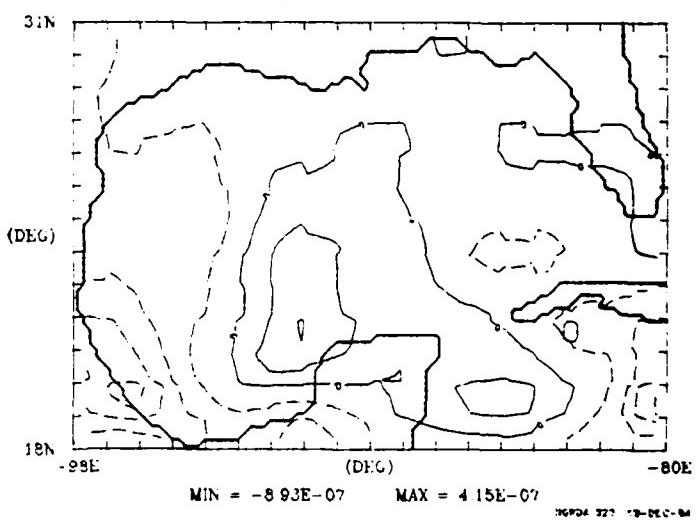
WIND STRESS CURL
OCTOBER/1969 DC = 2.0E-07 MKS



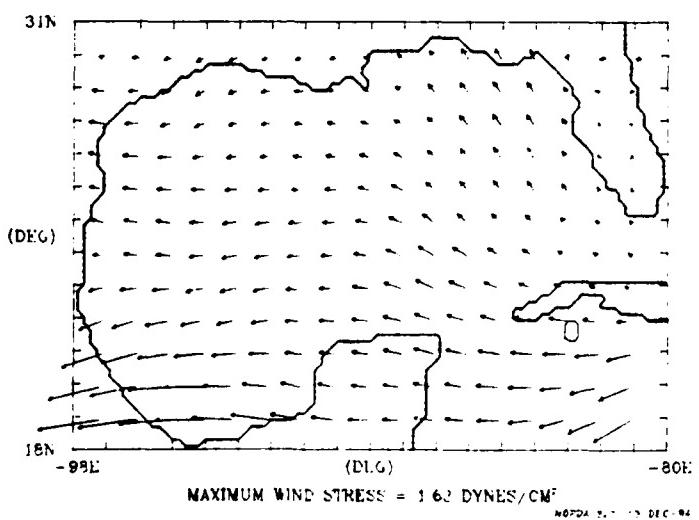
WIND STRESS
NOVEMBER/1969



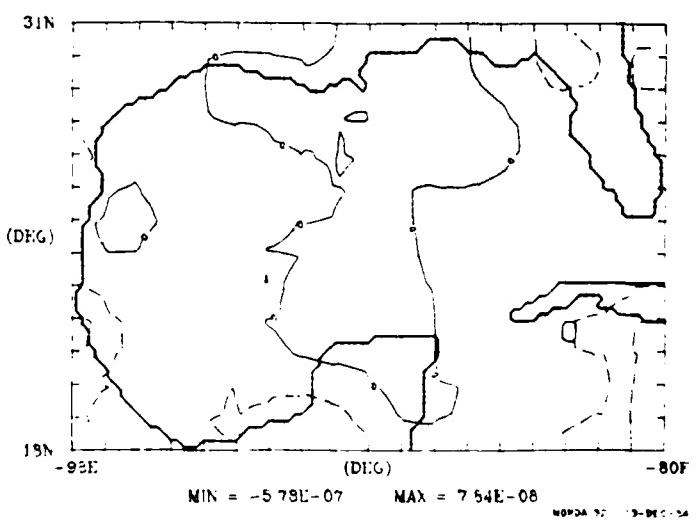
WIND STRESS CURL
NOVEMBER/1969 DC = 2.0E-07 MKS



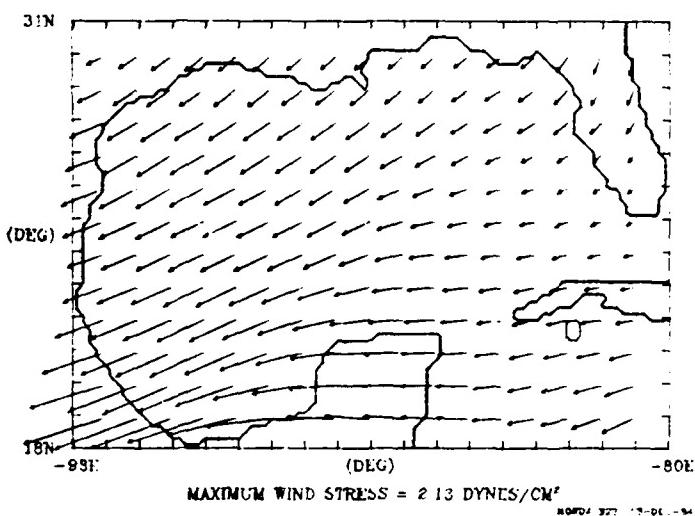
WIND STRESS
DECEMBER/1969



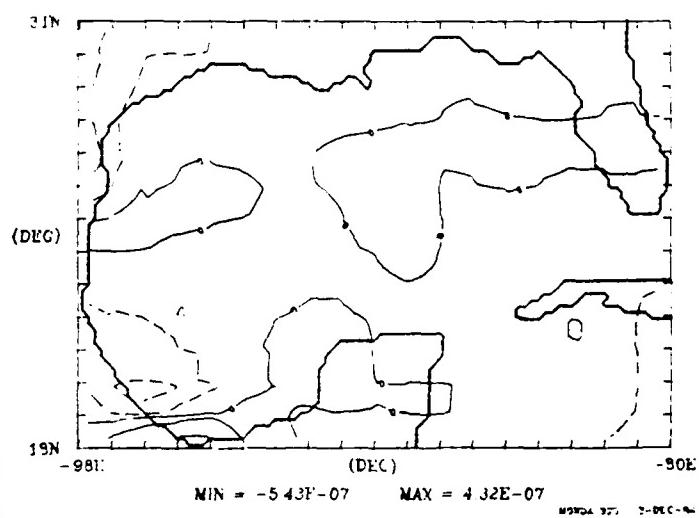
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DECEMBER/1969 DC = 2.0E-07 MKS



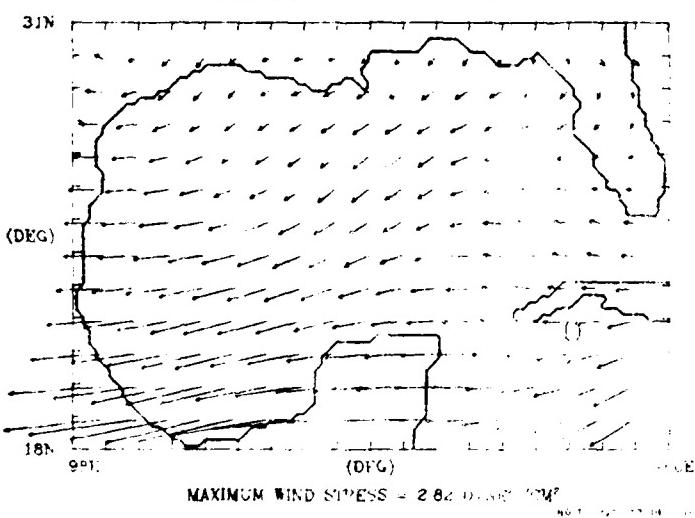
WIND STRESS
JANUARY/1970



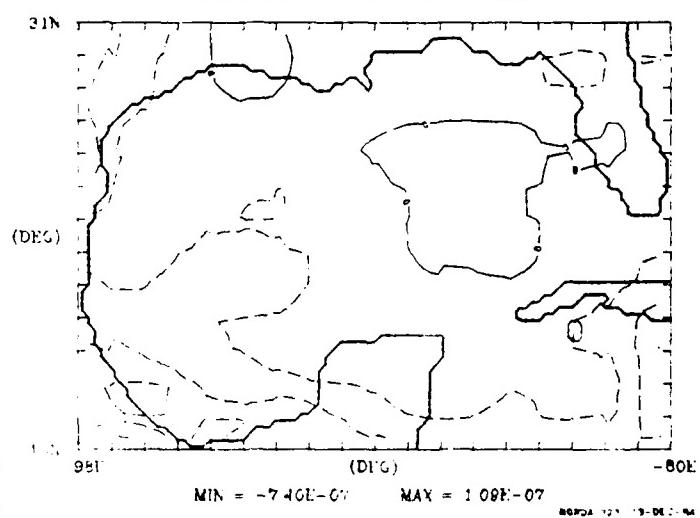
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JANUARY/1970 DC = 2.0E-07 MKS



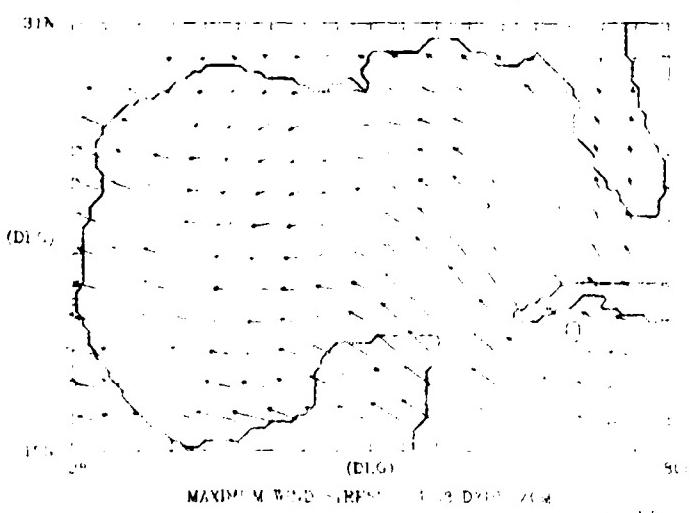
WIND STRESS
FEBRUARY/1970



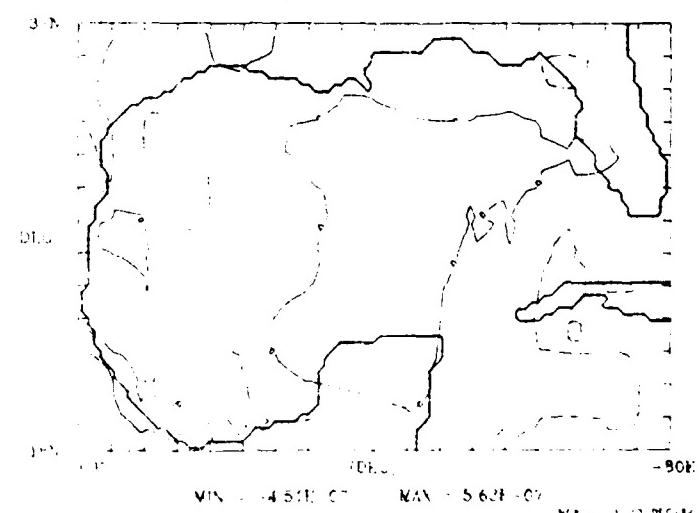
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FEBRUARY/1970 DC = 2.0E-07 MKS

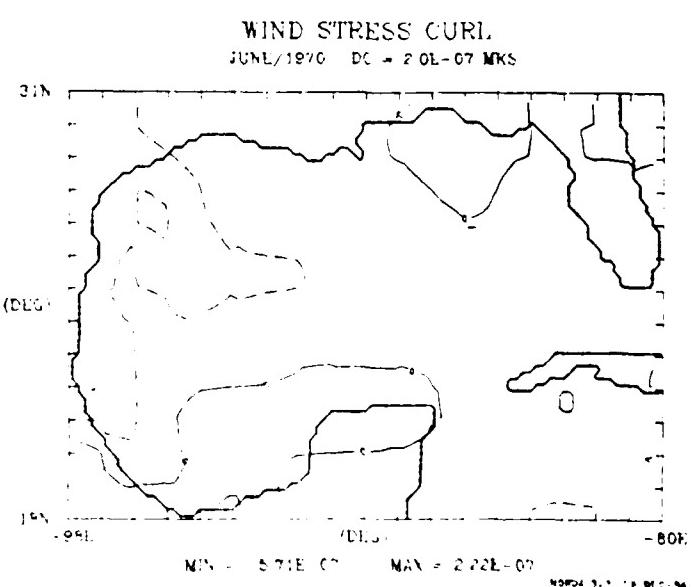
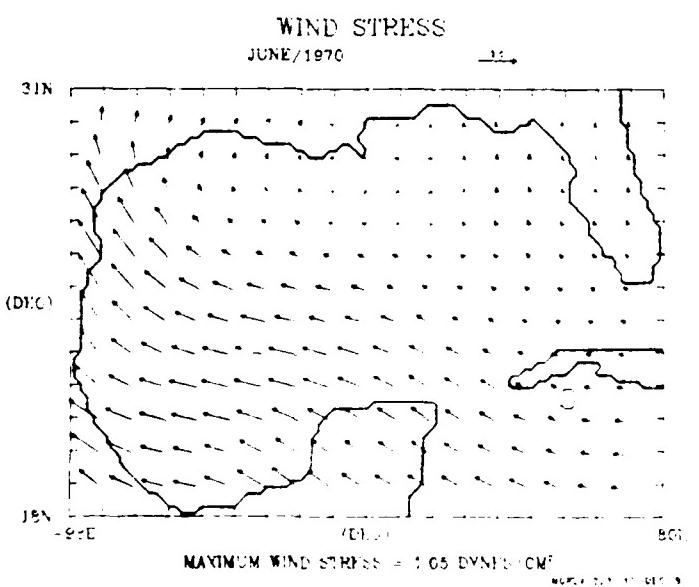
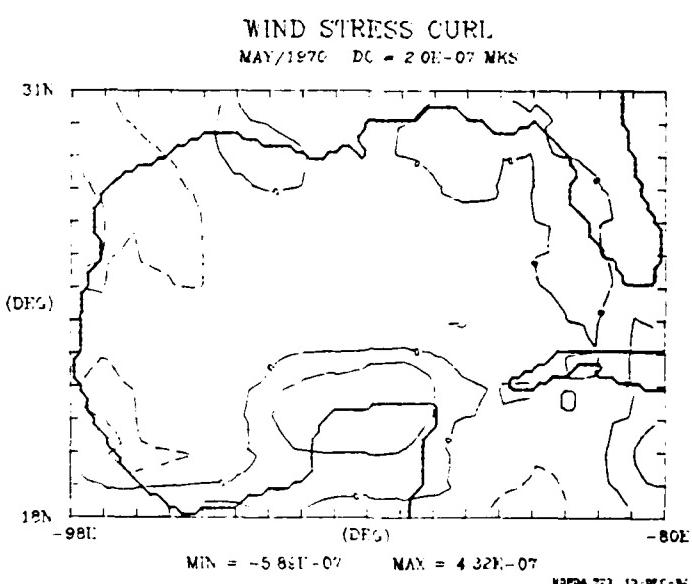
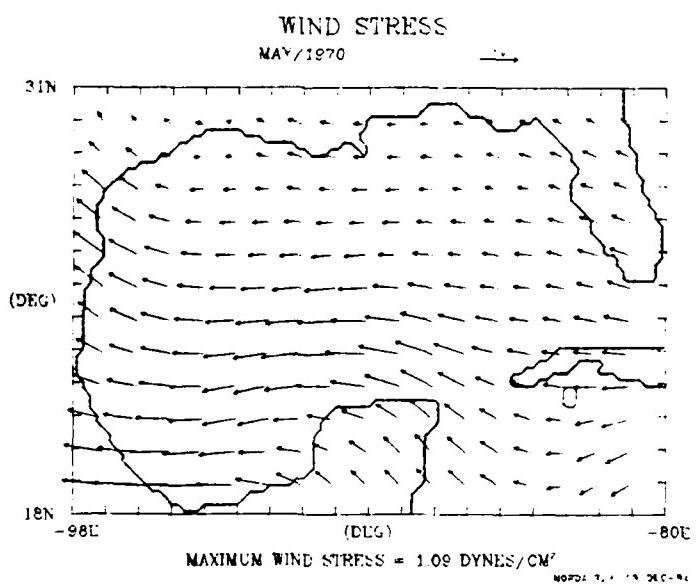
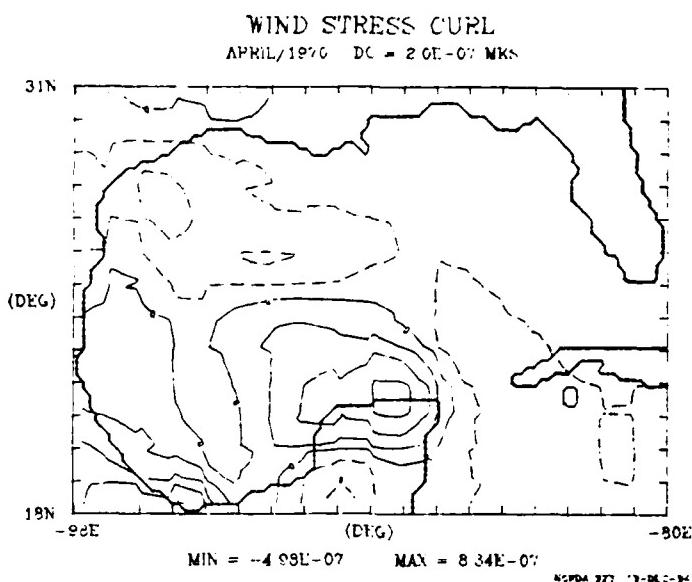
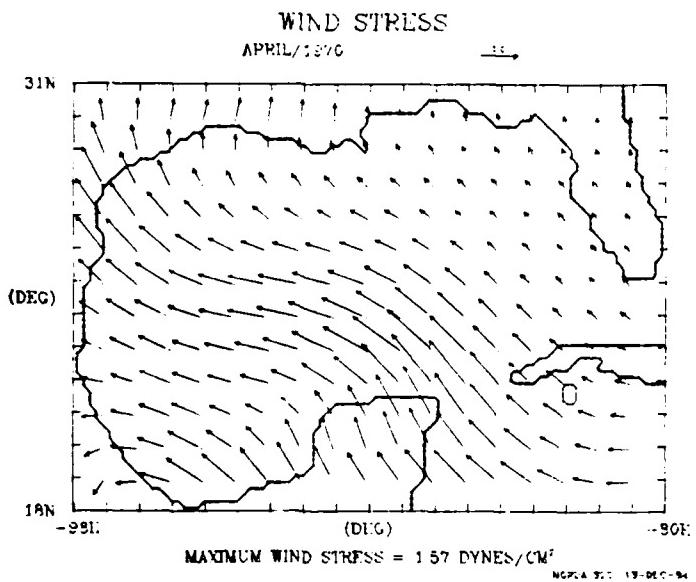


WIND STRESS
MARCH/1970



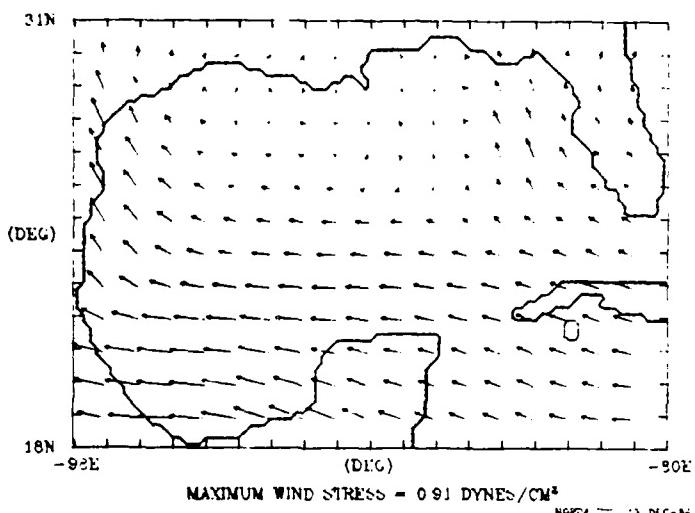
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MARCH/1970 DC = 2.0E-07 MKS



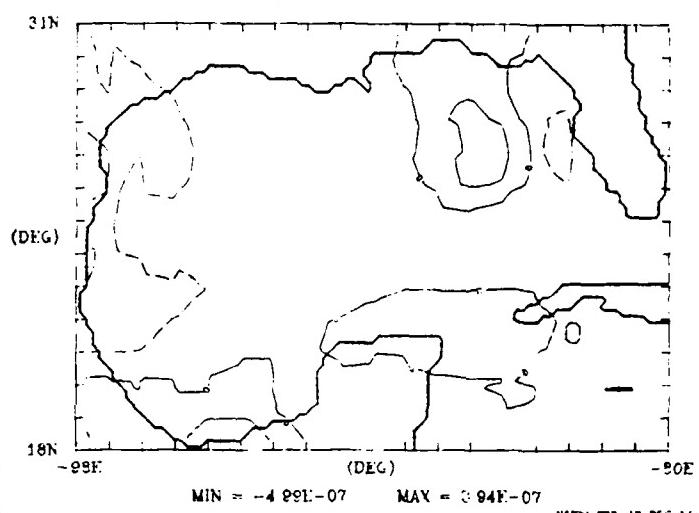


WIND STRESS
JULY/1970

$\frac{1}{16}$

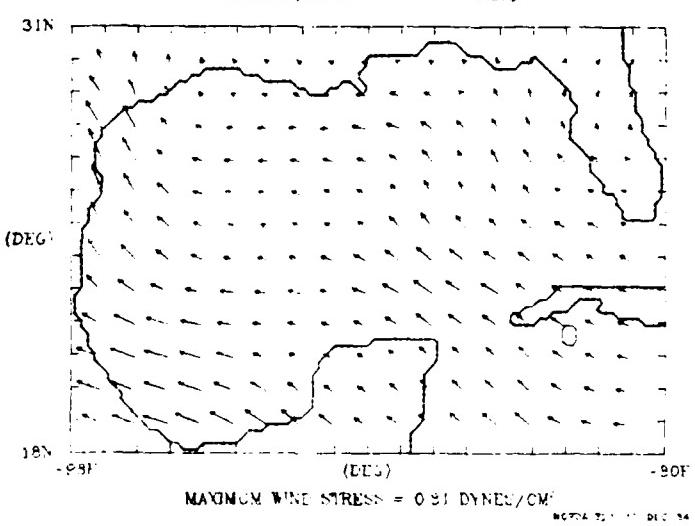


WIND STRESS CURL
JULY/1970 DC = 2.0E-07 MKS

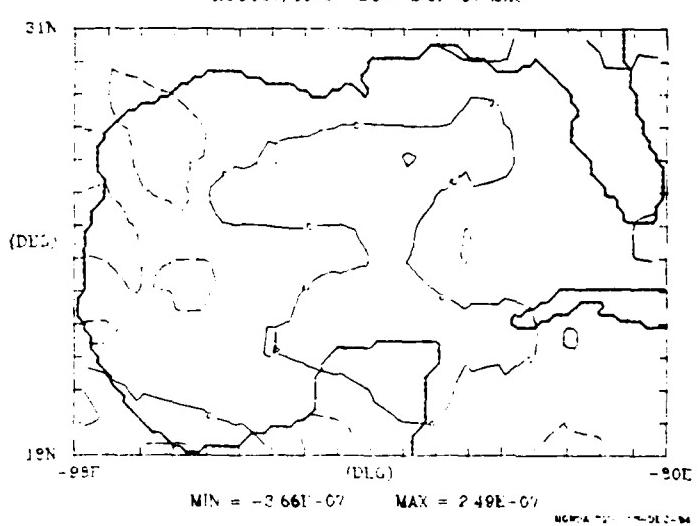


WIND STRESS
AUGUST/1970

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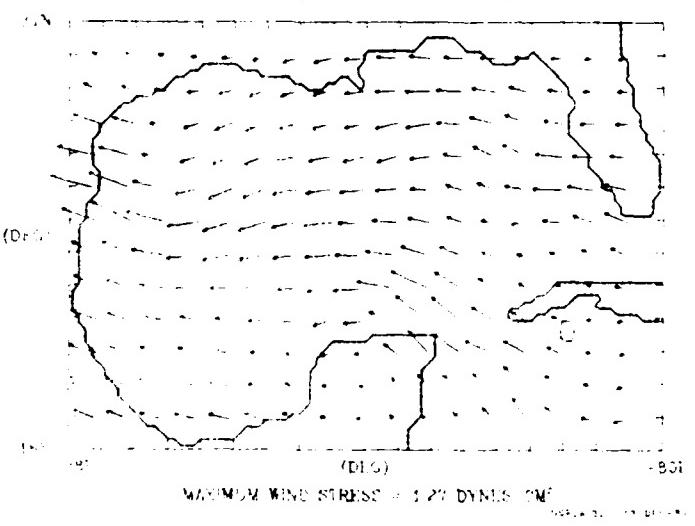


WIND STRESS CURL
AUGUST/1970 DC = 2.01E-07 MKS

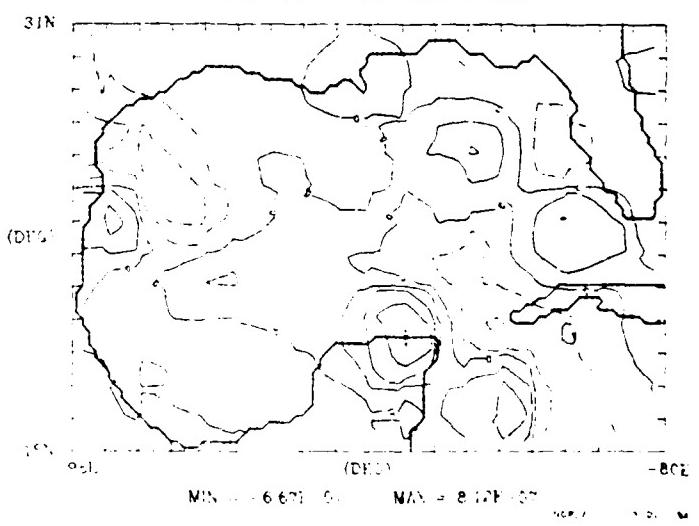


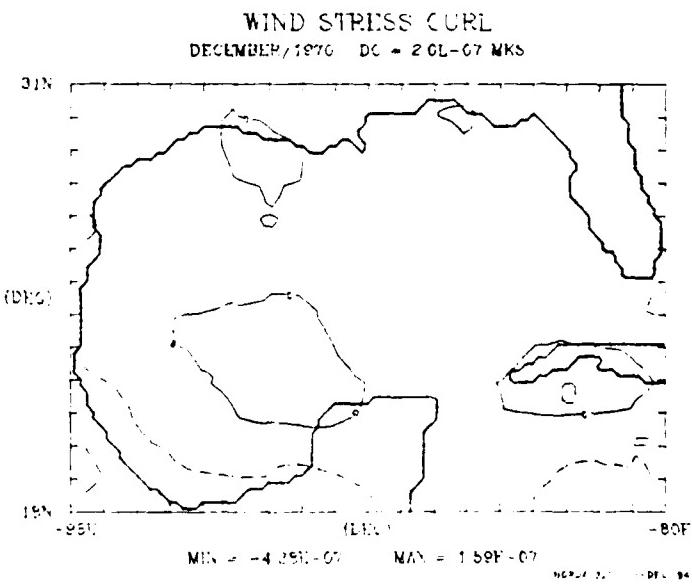
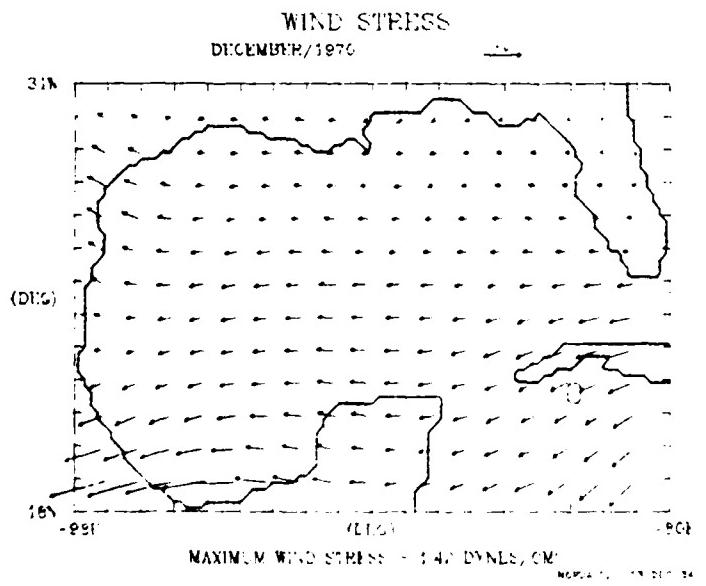
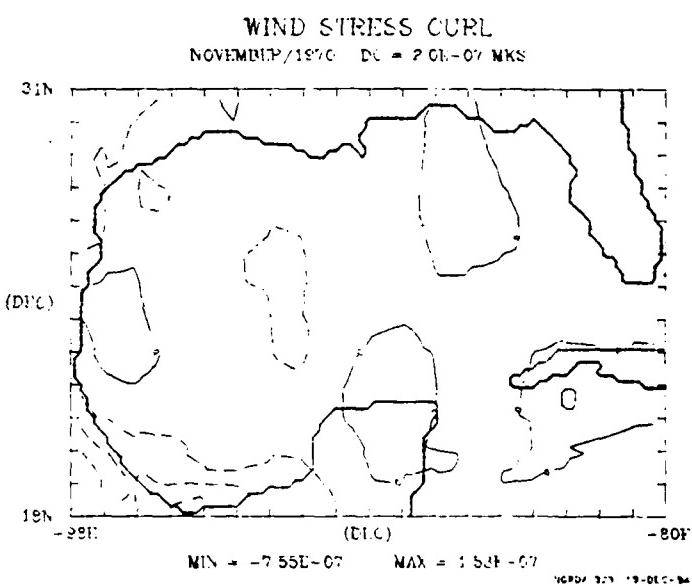
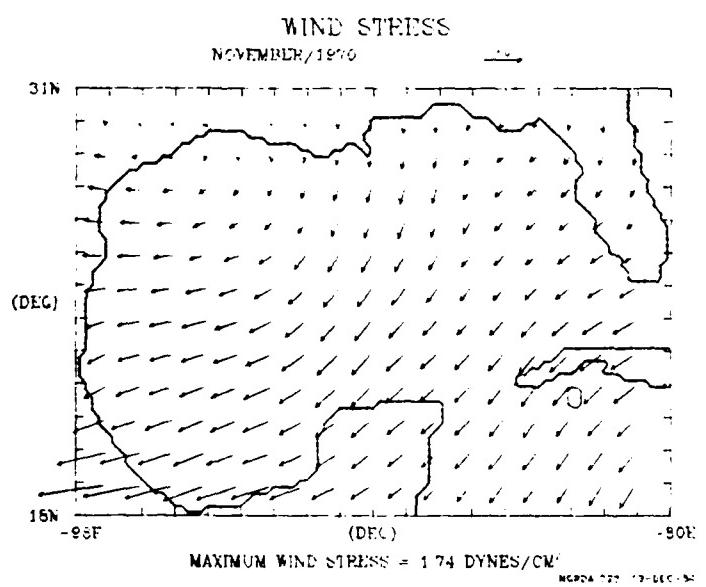
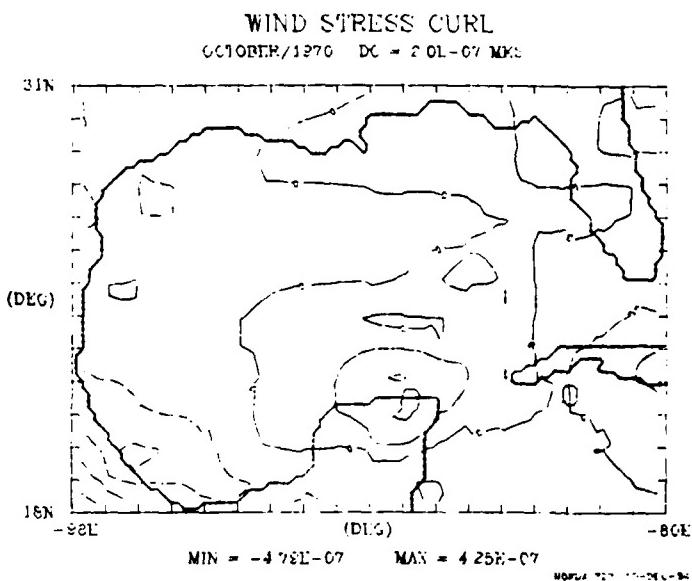
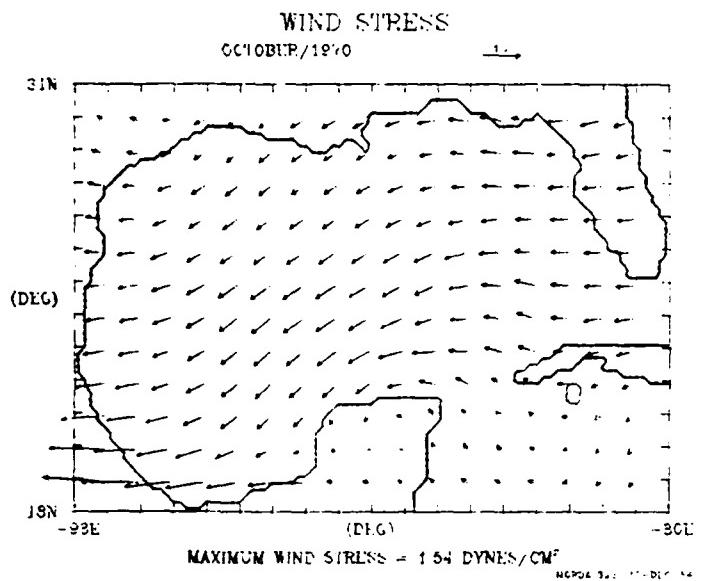
WIND STRESS
SEPTEMBER/1970

$\frac{1}{16}$

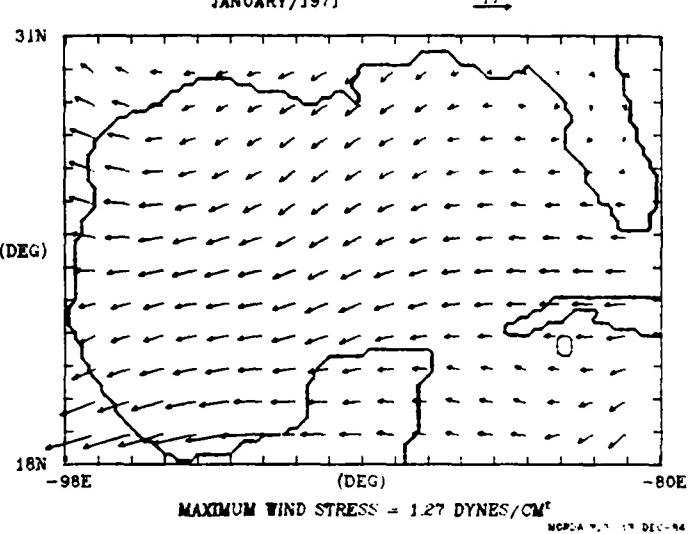


WIND STRESS CURL
SEPTEMBER/1970 DC = 2.0E-07 MKS

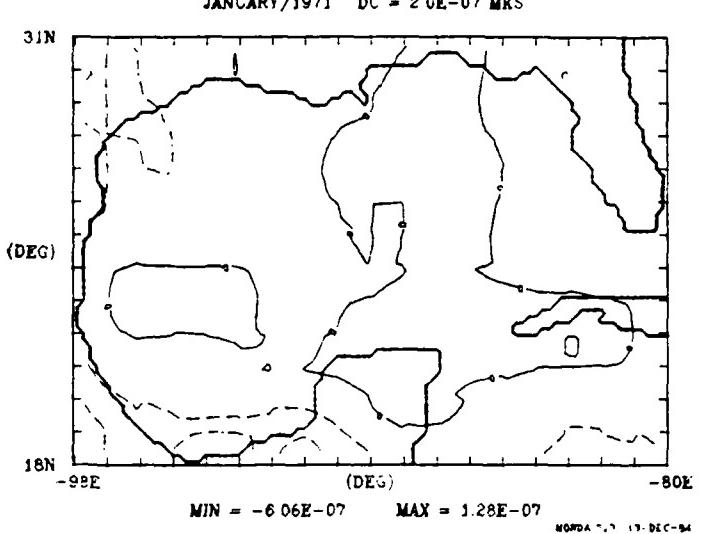




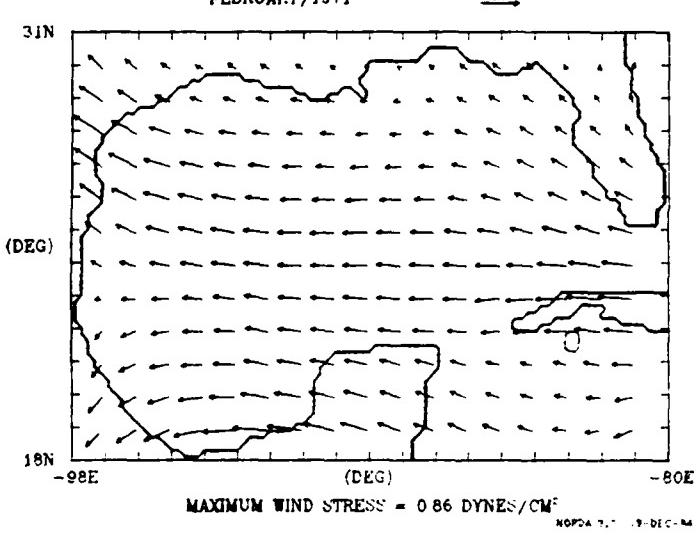
WIND STRESS
JANUARY/1971



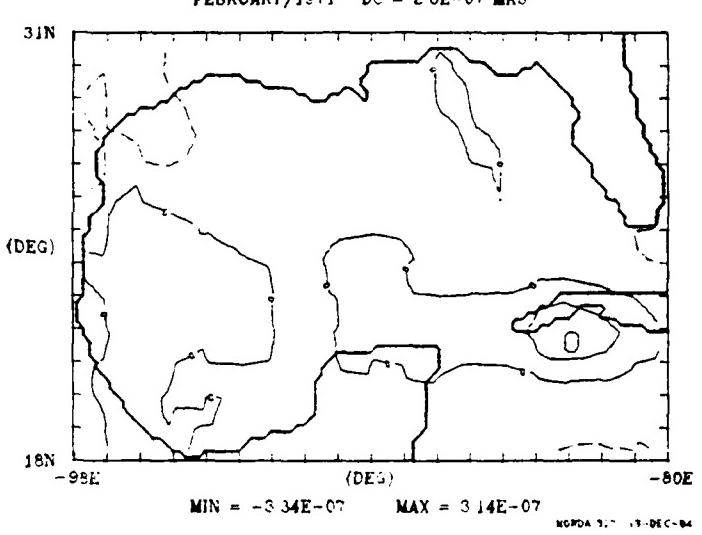
WIND STRESS CURL
JANUARY/1971 DC = 2.0E-07 MKS



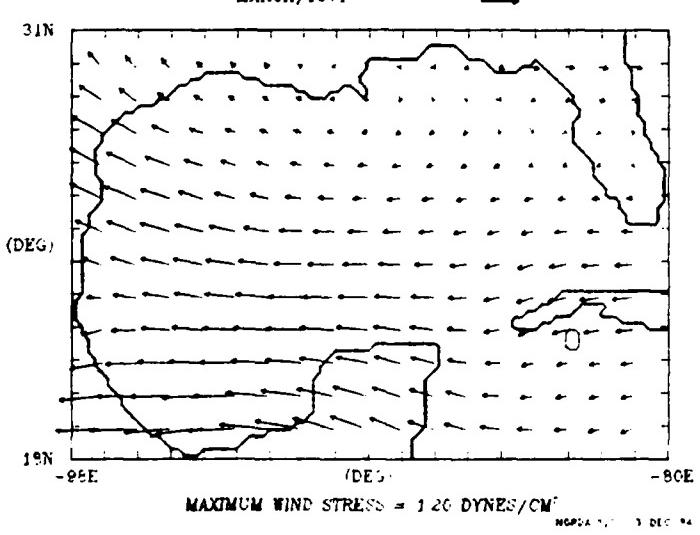
WIND STRESS
FEBRUARY/1971



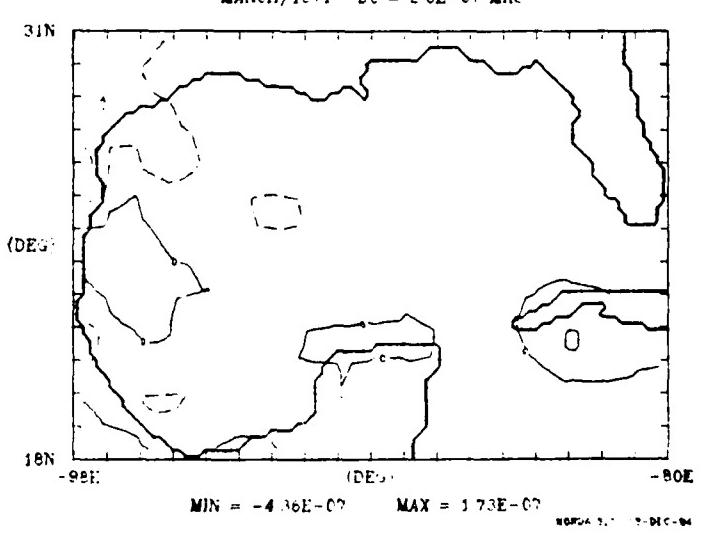
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FEBRUARY/1971 DC = 2.0E-07 MKS

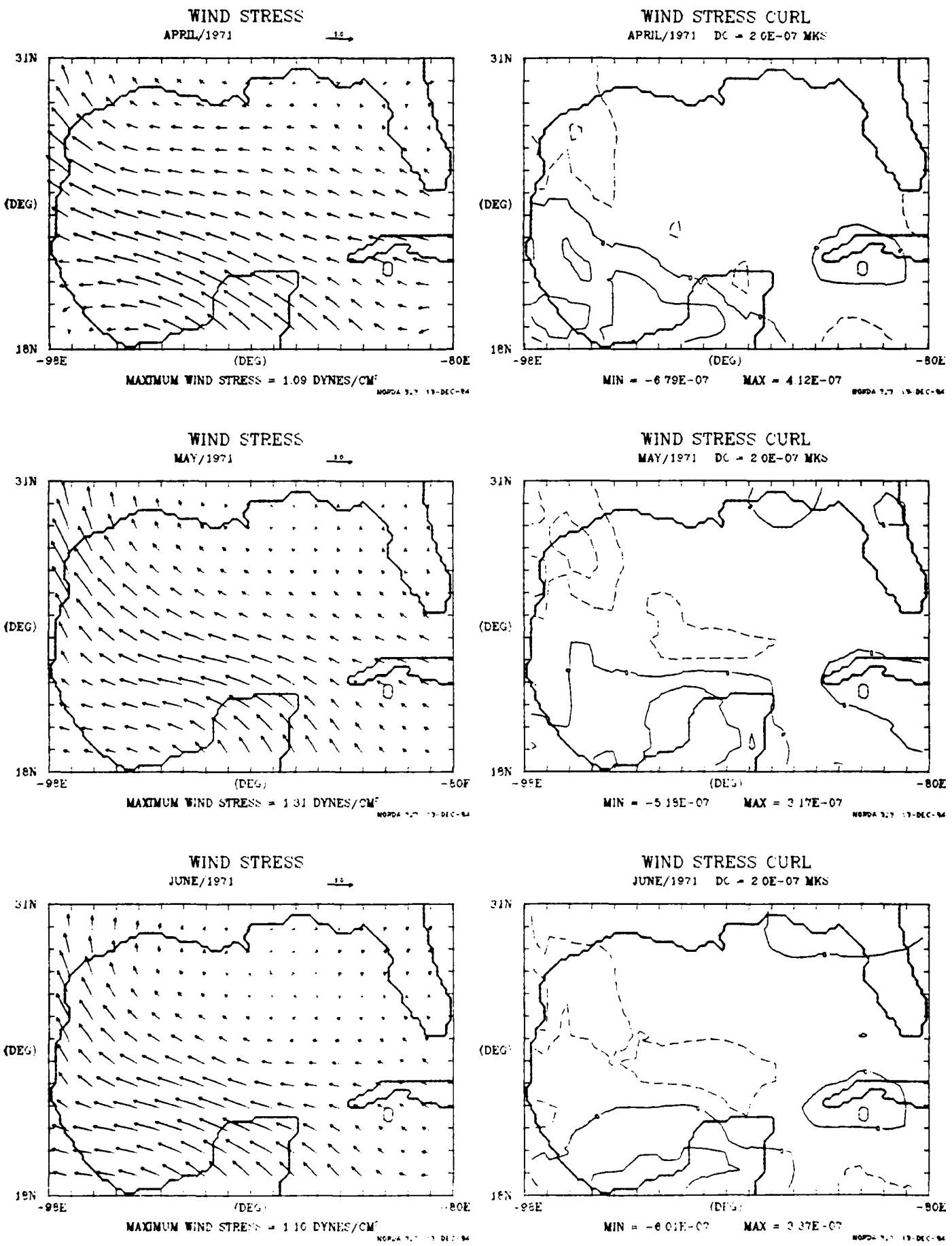


WIND STRESS
MARCH/1971



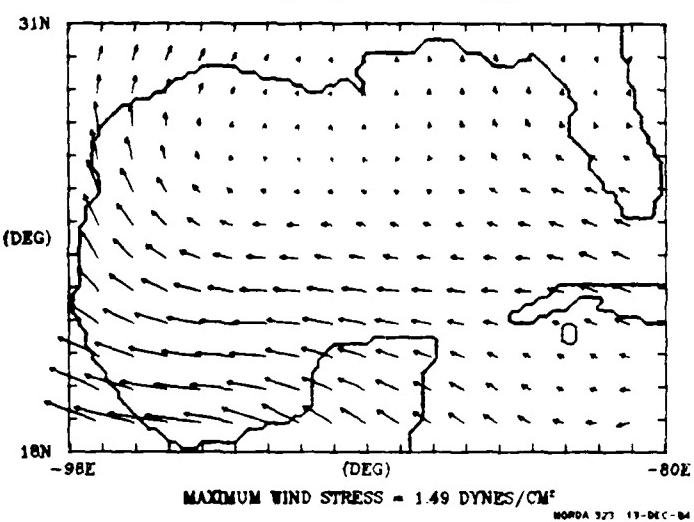
WIND STRESS CURL
MARCH/1971 DC = 2.0E-07 MKS



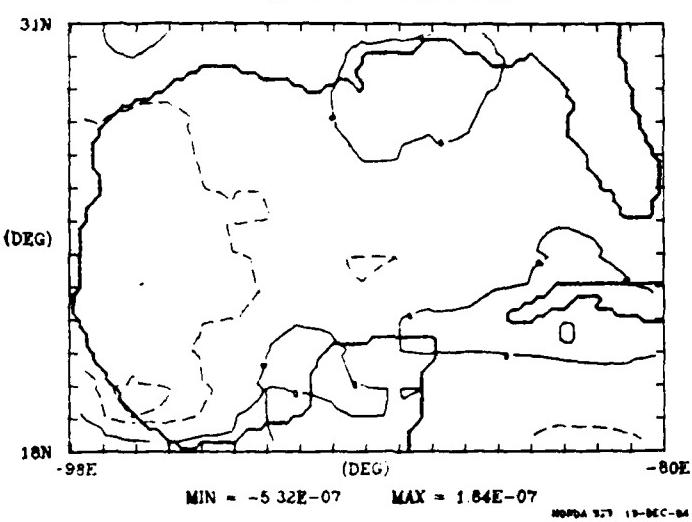


WIND STRESS
JULY/1971

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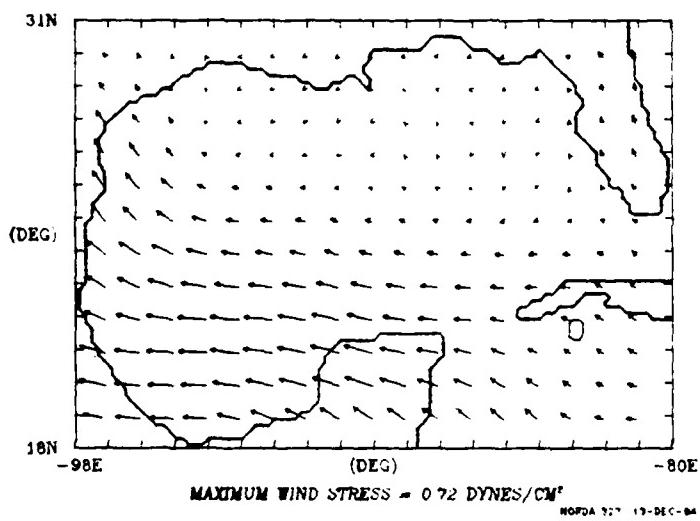


WIND STRESS CURL
JULY/1971 DC = 2.0E-07 MKS

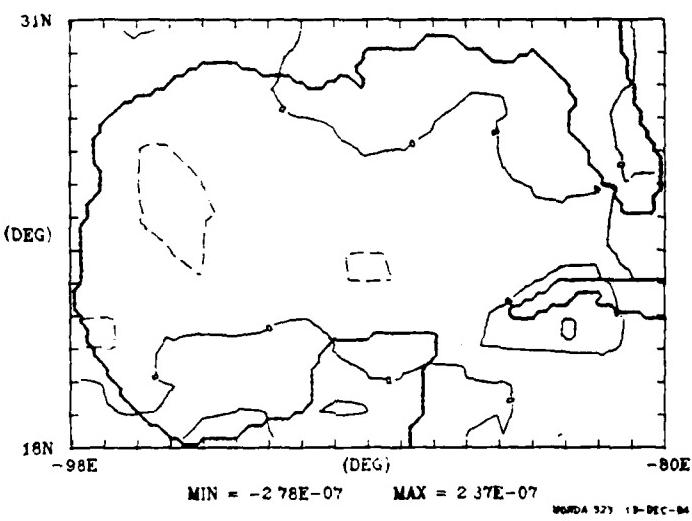


WIND STRESS
AUGUST/1971

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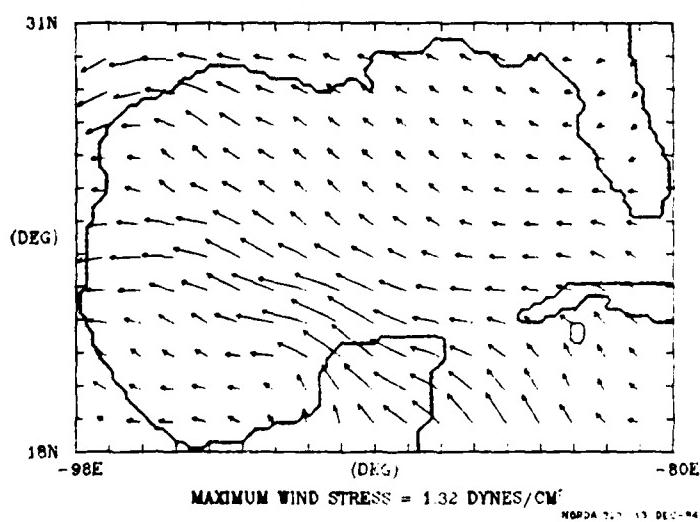


WIND STRESS CURL
AUGUST/1971 DC = 2.0E-07 MKS

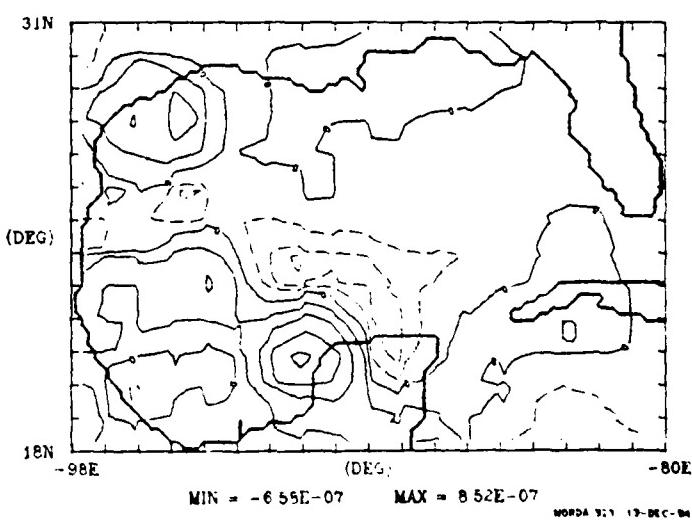


WIND STRESS
SEPTEMBER/1971

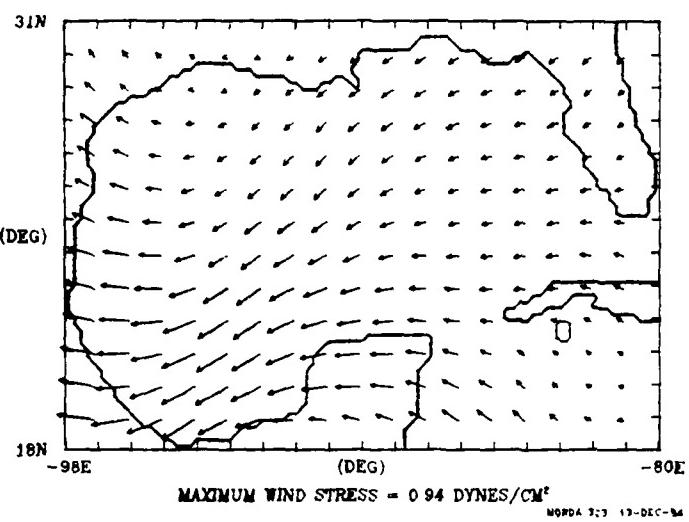
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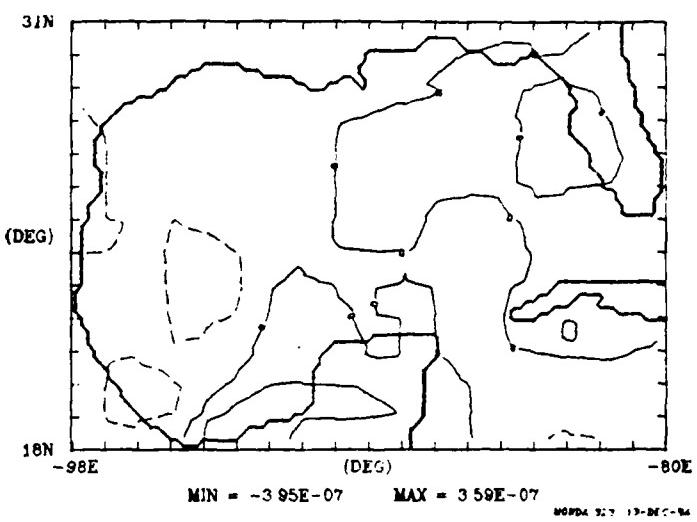
WIND STRESS CURL
SEPTEMBER/1971 DC = 2.0E-07 MKS



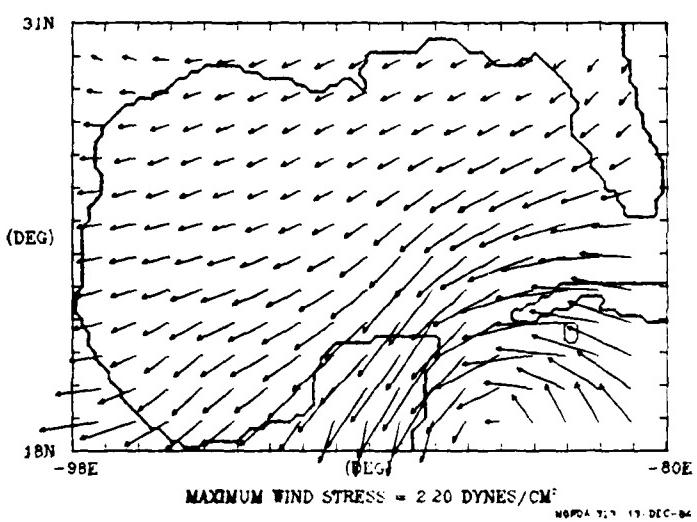
WIND STRESS
OCTOBER/1971



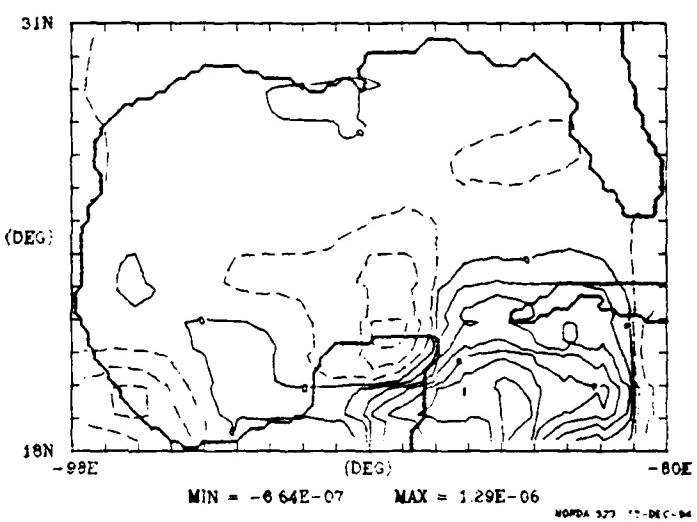
WIND STRESS CURL
OCTOBER/1971 DC = 2.0E-07 MKS



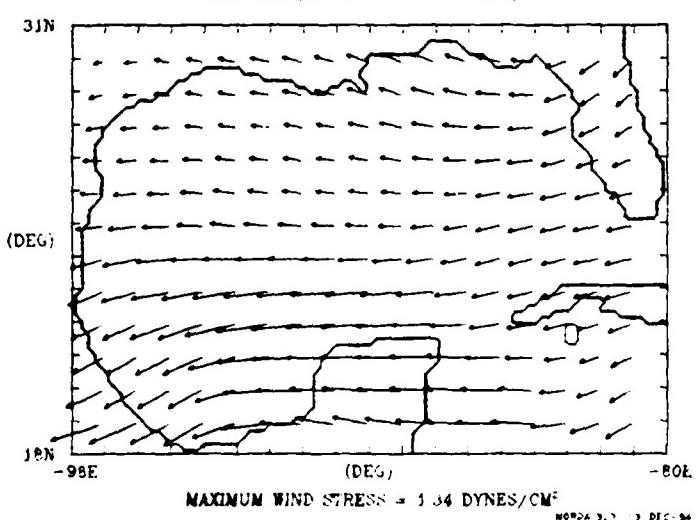
WIND STRESS
NOVEMBER/1971



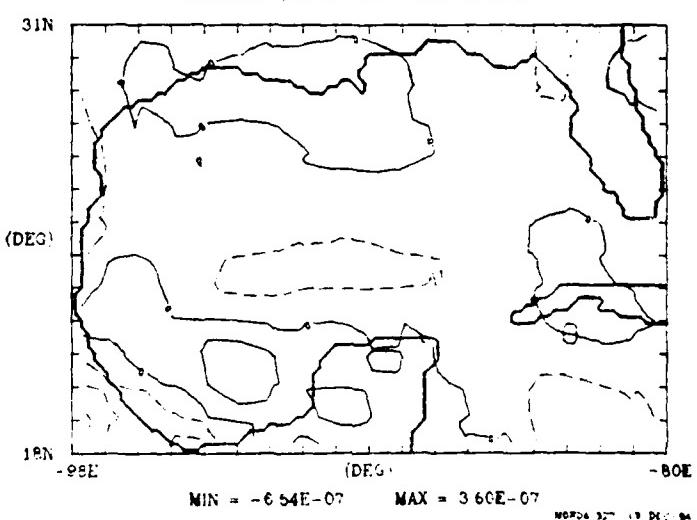
WIND STRESS CURL
NOVEMBER/1971 DC = 2.0E-07 MKS



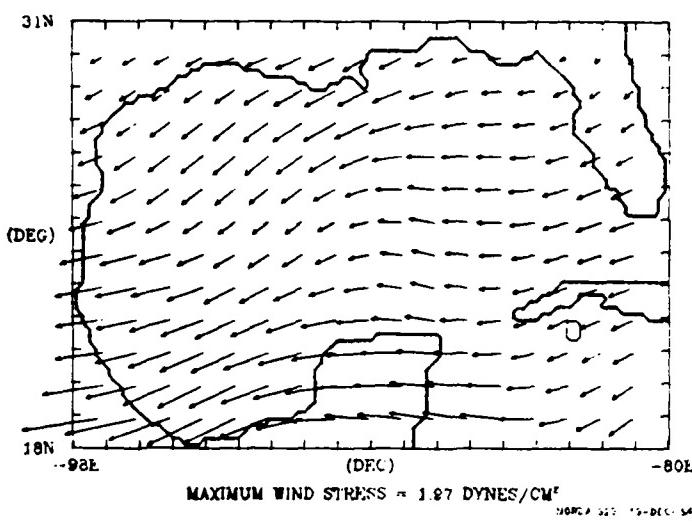
WIND STRESS
DECEMBER/1971



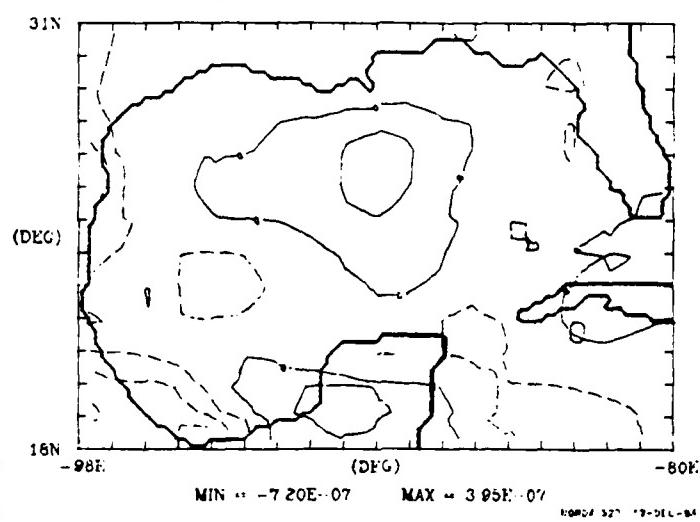
WIND STRESS CURL
DECEMBER/1971 DC = 2.0E-07 MKS



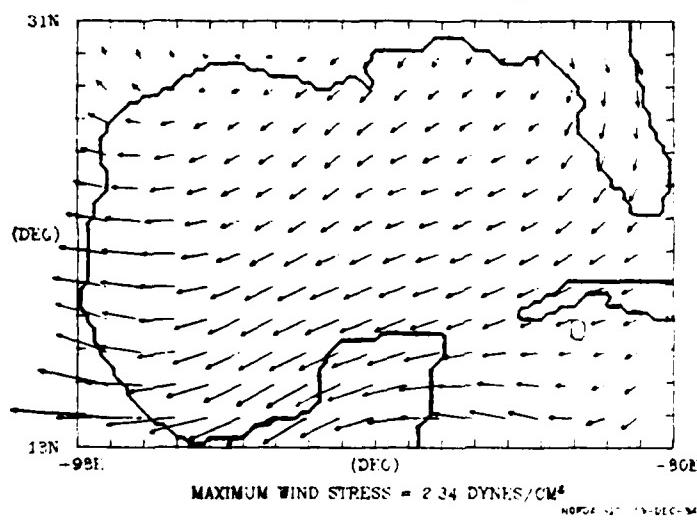
WIND STRESS
JANUARY/1972



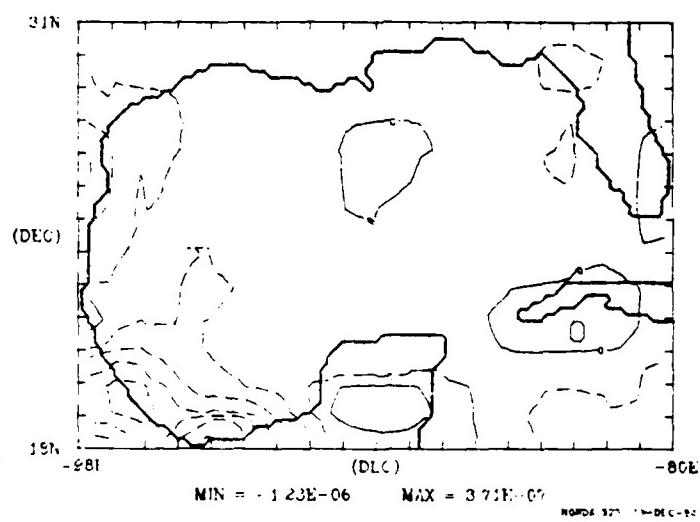
WIND STRESS CURL
JANUARY/1972 DC = 2.0E-07 MKS



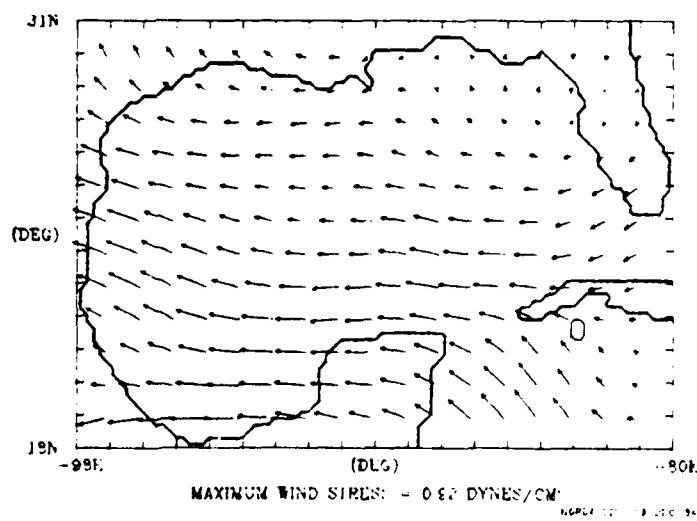
WIND STRESS
FEBRUARY/1972



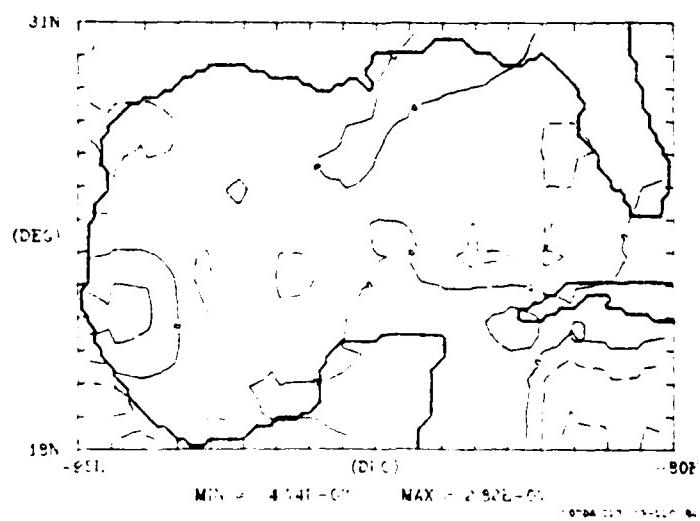
WIND STRESS CURL
FEBRUARY/1972 DC = 2.0E-07 MKS



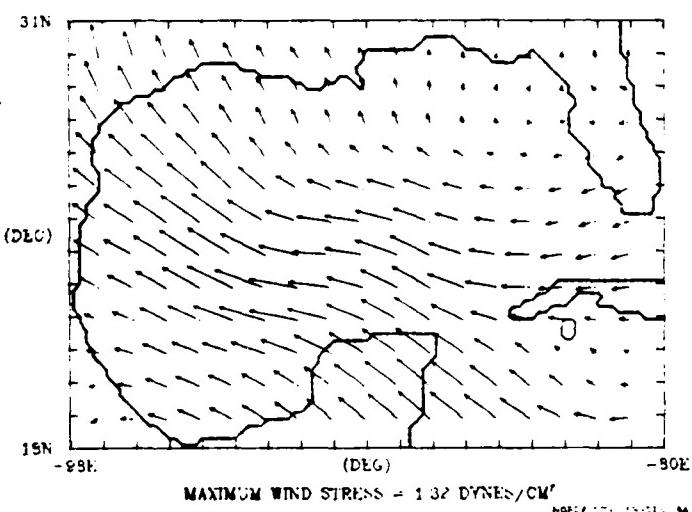
WIND STRESS
MARCH/1972



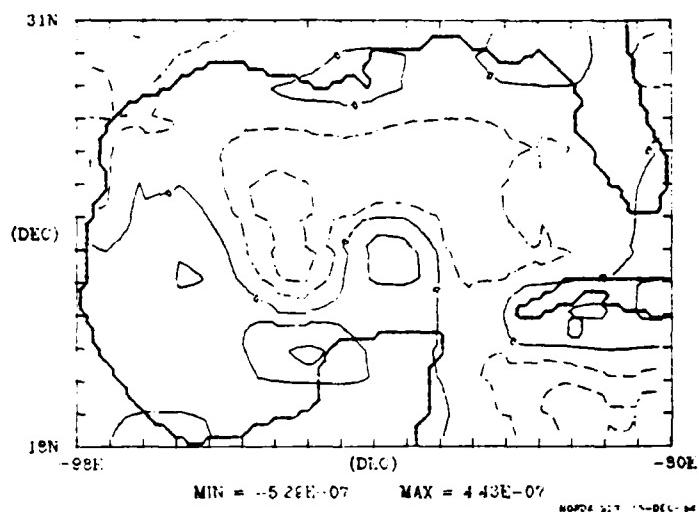
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MARCH/1972 DC = 2.0E-07 MKS



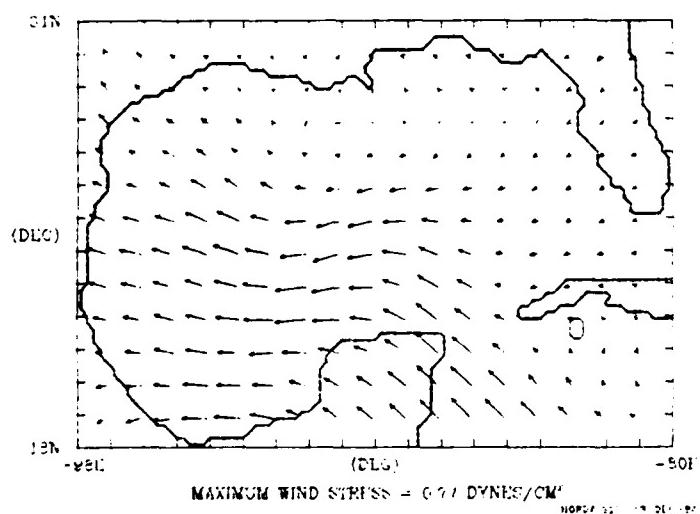
WIND STRESS
APRIL/1972



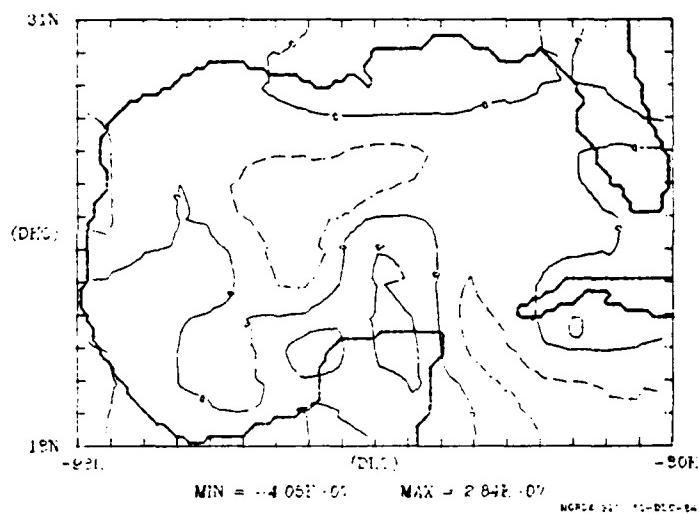
WIND STRESS CURL
APRIL/1972 DC = 2.0E-07 MKS



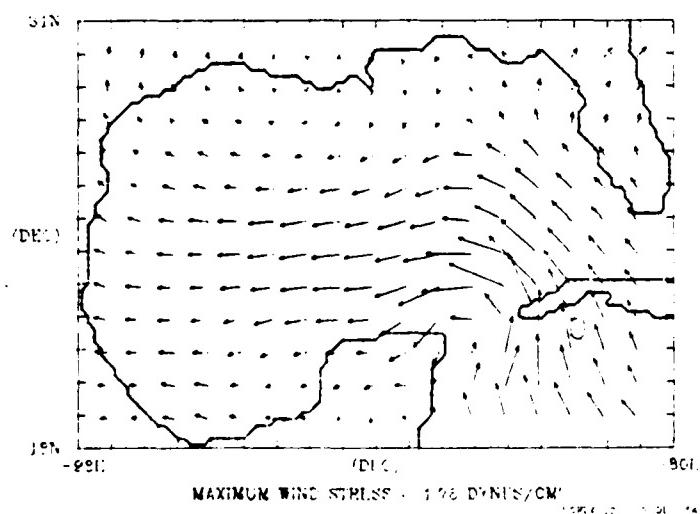
WIND STRESS
MAY/1972



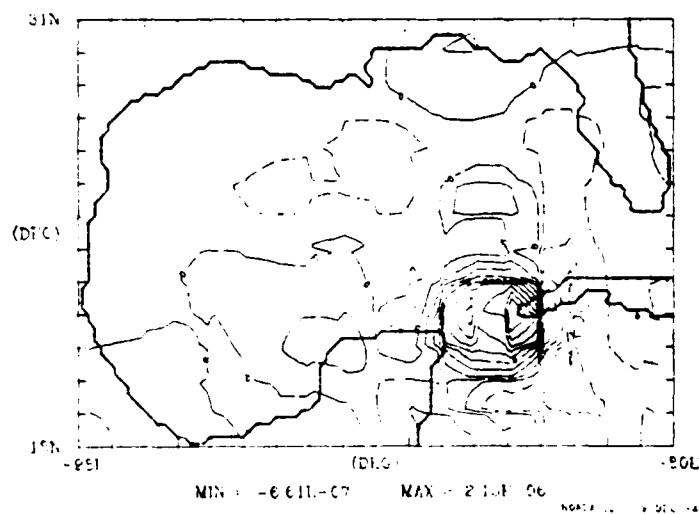
WIND STRESS CURL
MAY/1972 DC = 2.0E-07 MKS



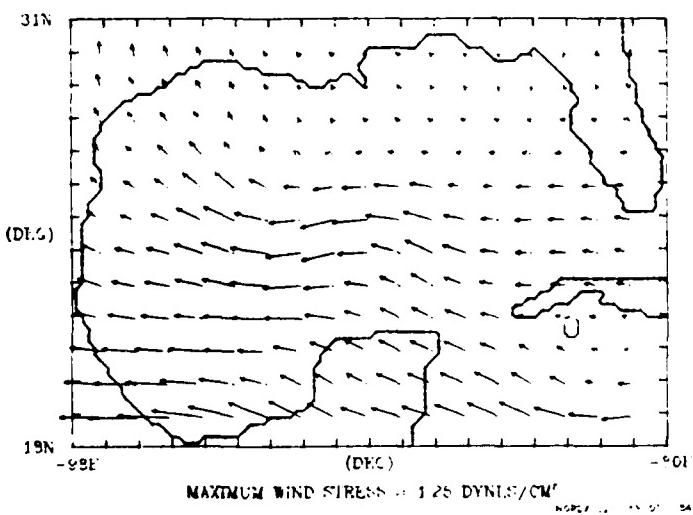
WIND STRESS
JUN/1972



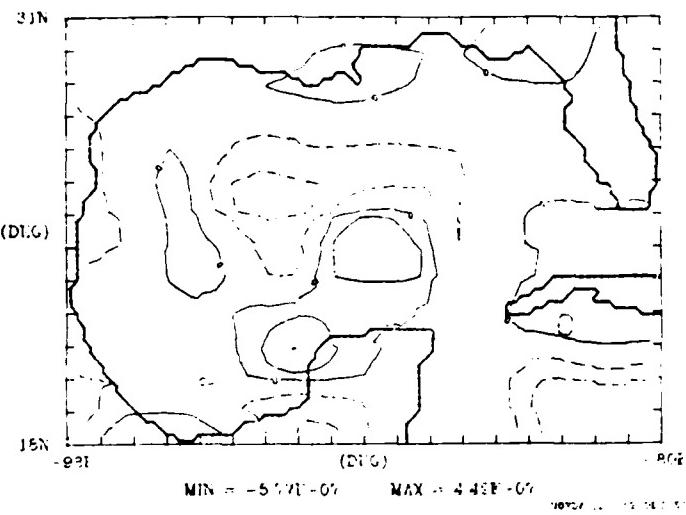
WIND STRESS CURL
JUN/1972 DC = 2.0E-07 MKS



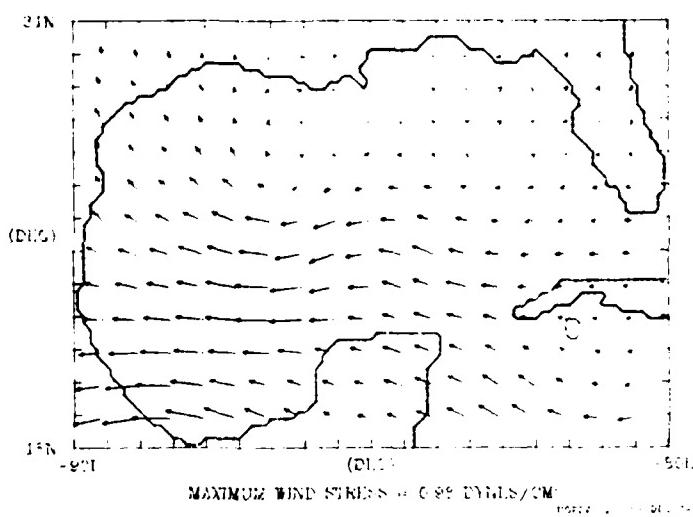
WIND STRESS
JULY/1972



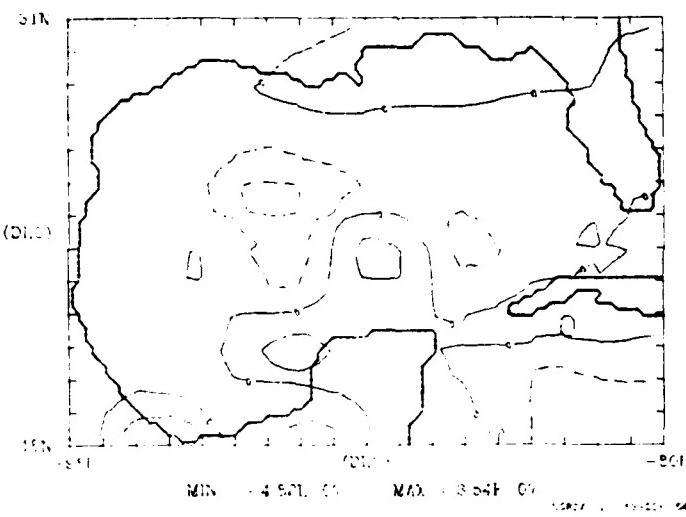
WIND STRESS CURL
JULY/1972 DC = 2.0E-07 MKS



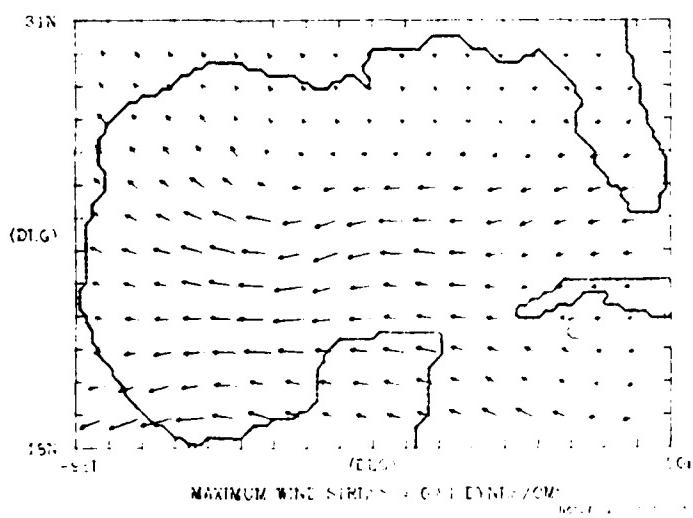
WIND STRESS
AUGUST/1972



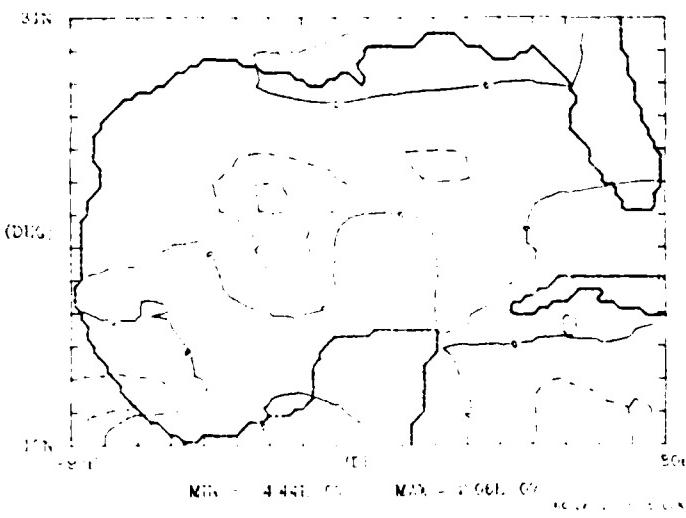
WIND STRESS CURL
AUGUST/1972 DC = 2.0E-07 MKS

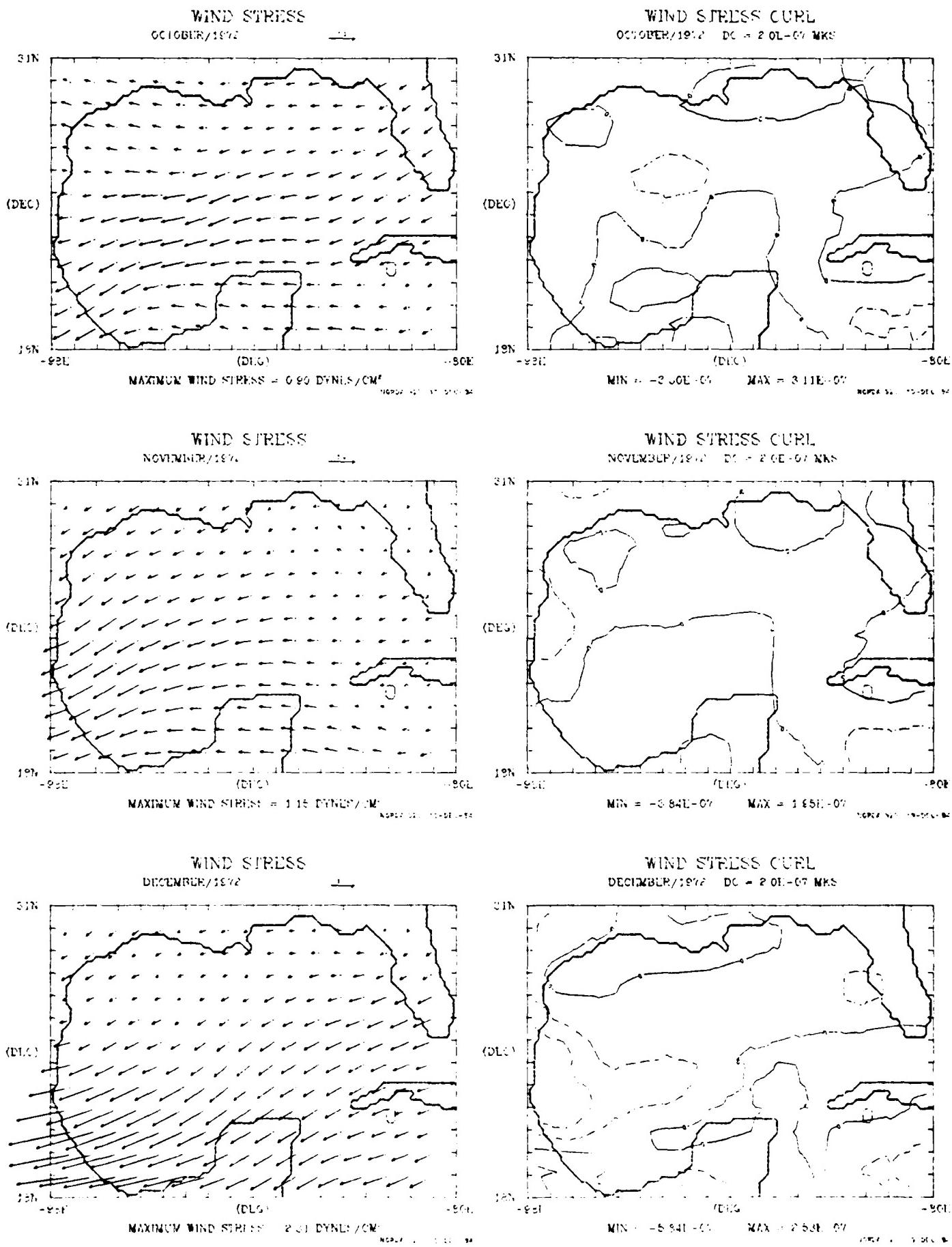


WIND STRESS
SEPTEMBER/1972

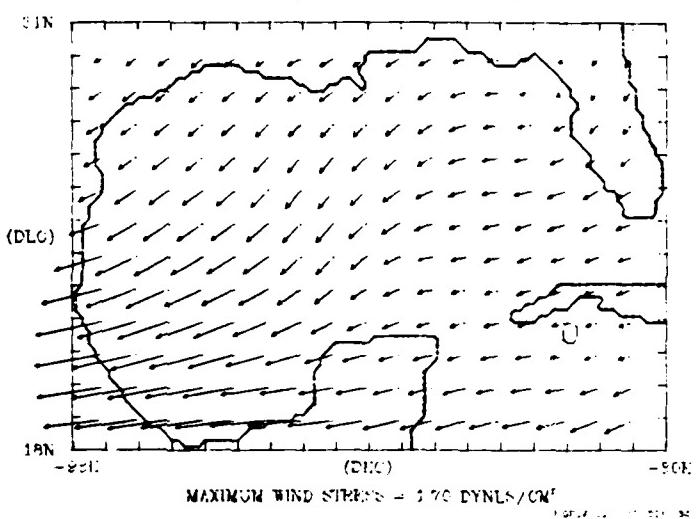


WIND STRESS CURL
SEPTEMBER/1972 DC = 2.0E-07 MKS

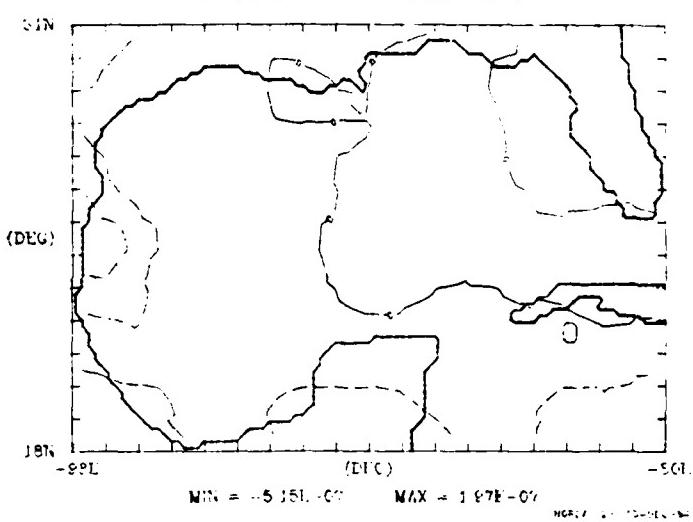




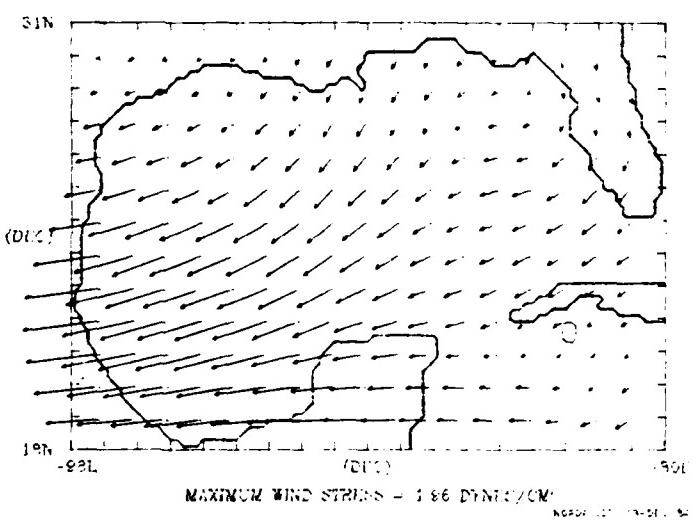
WIND STRESS
JANUARY/1970



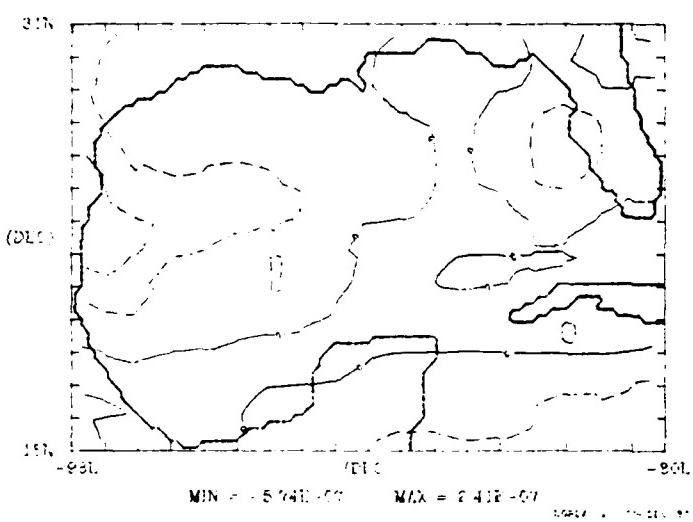
WIND STRESS CURL
JANUARY/1970 DC = 2.01E-07 M/S



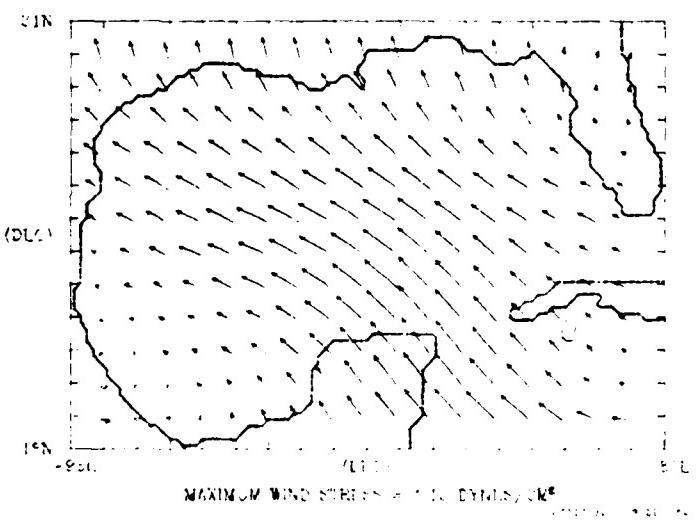
WIND STRESS
FEBRUARY/1970



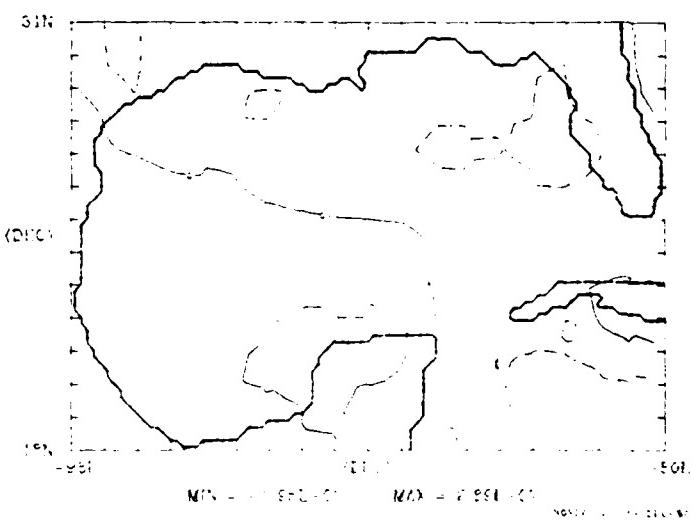
WIND STRESS CURL
FEBRUARY/1970 DC = 2.01E-07 M/S

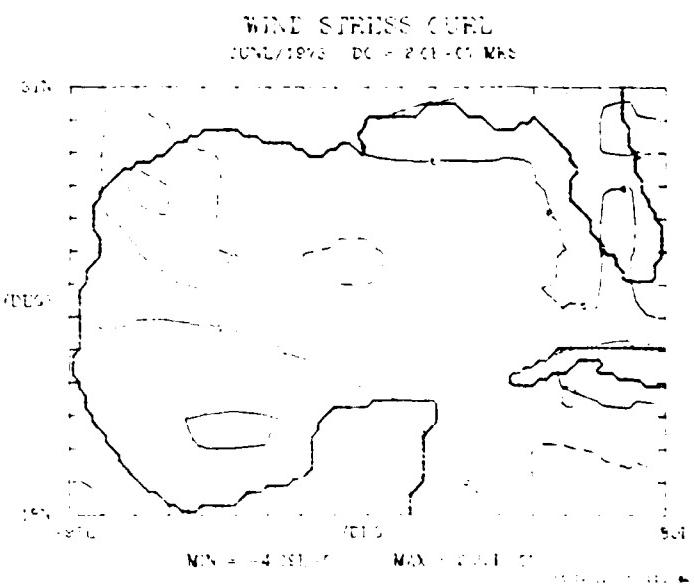
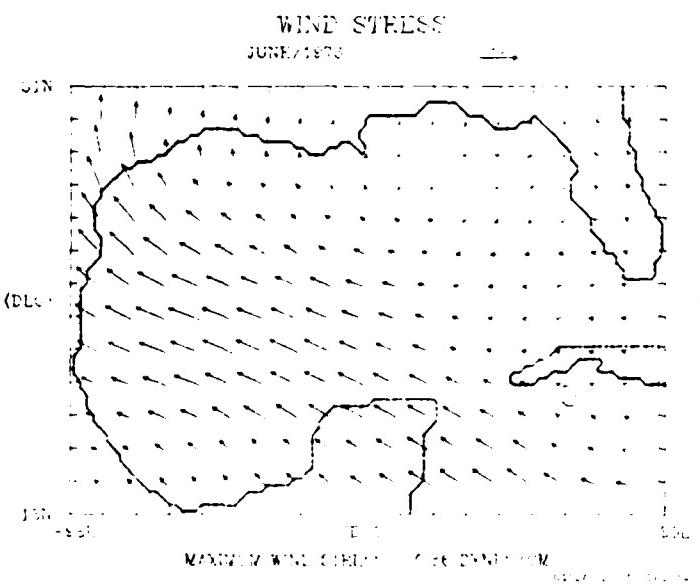
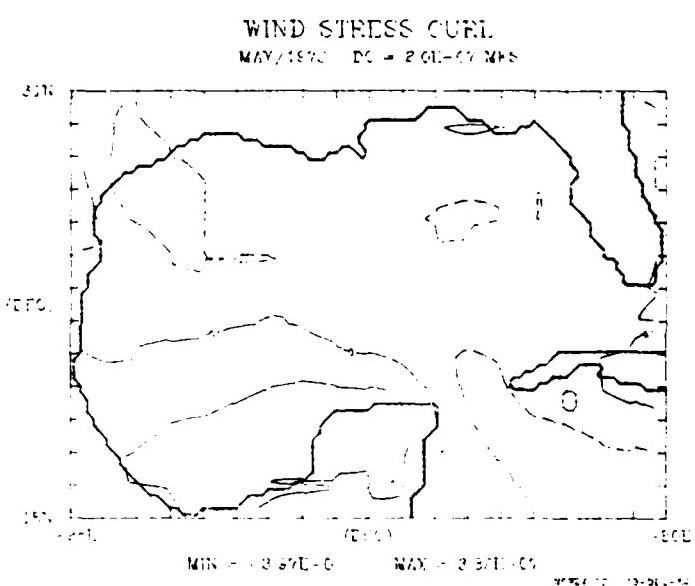
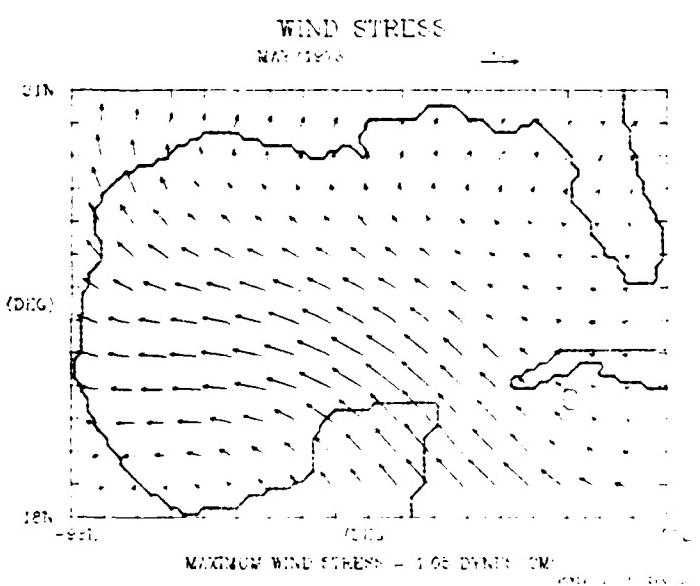
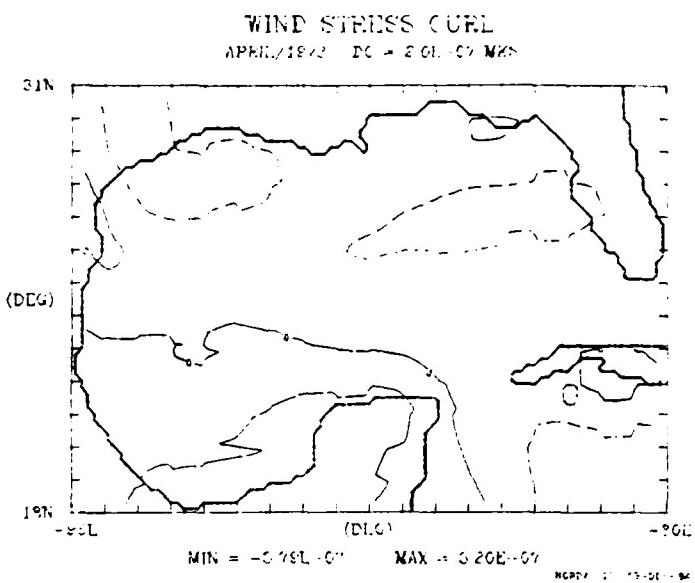
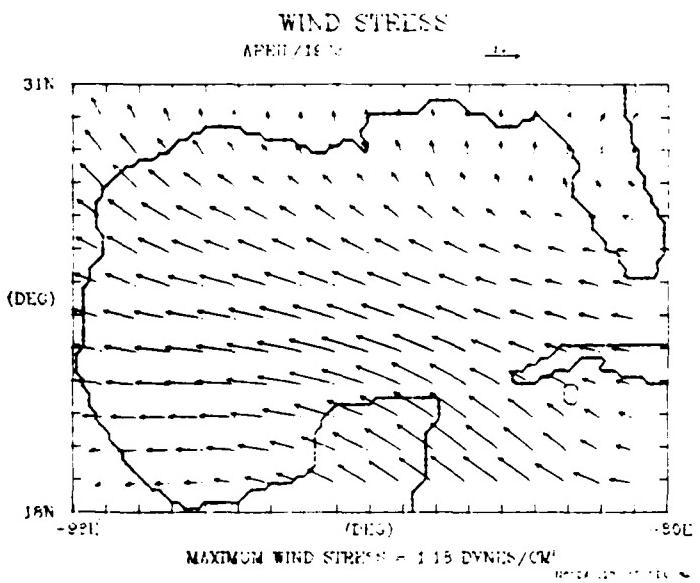


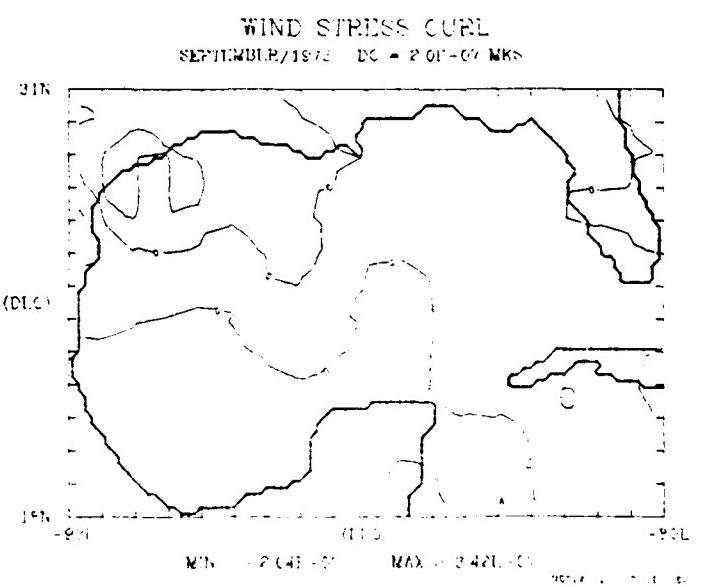
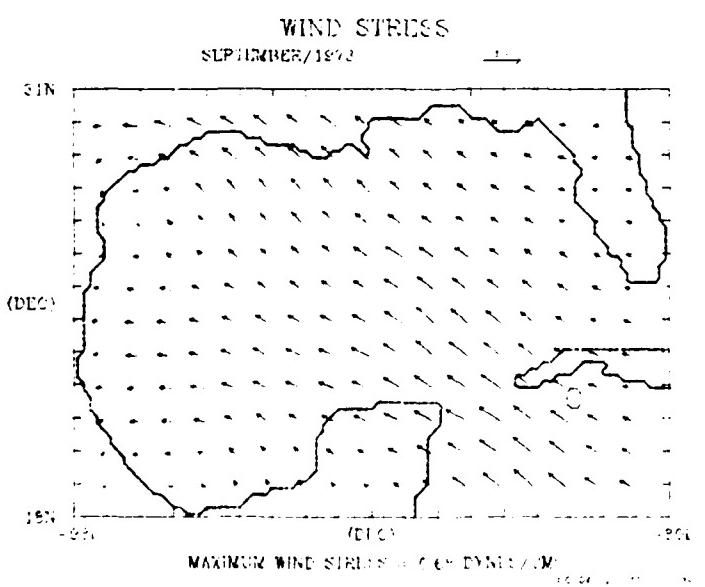
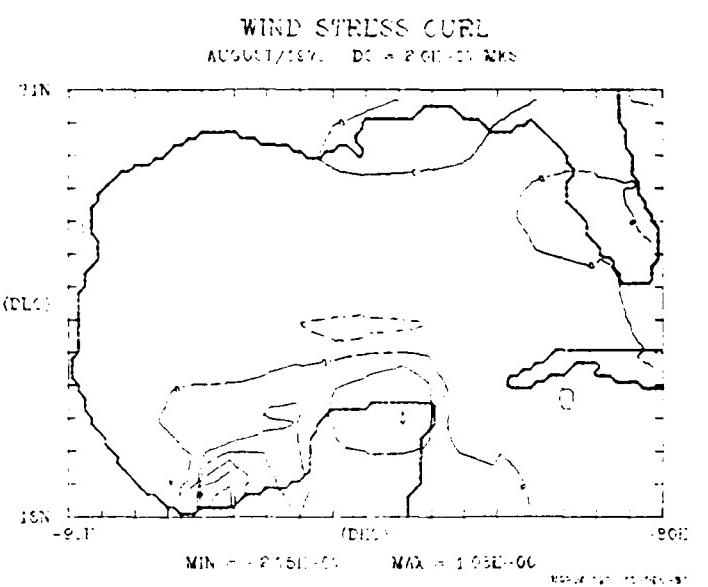
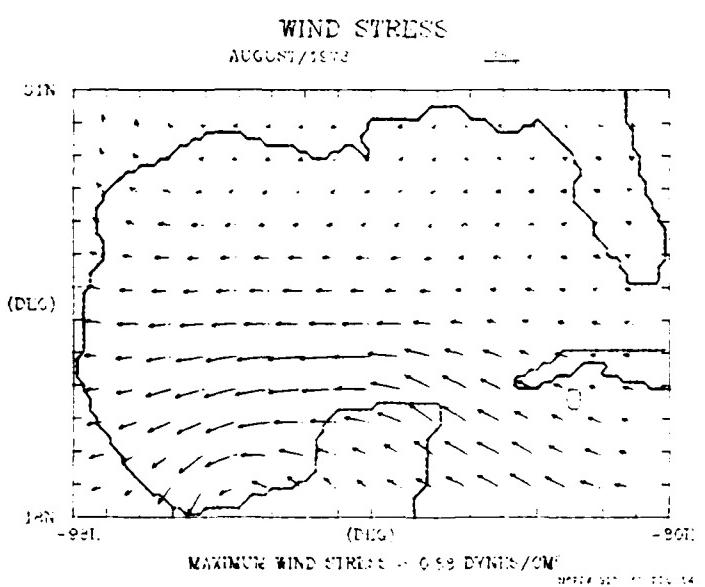
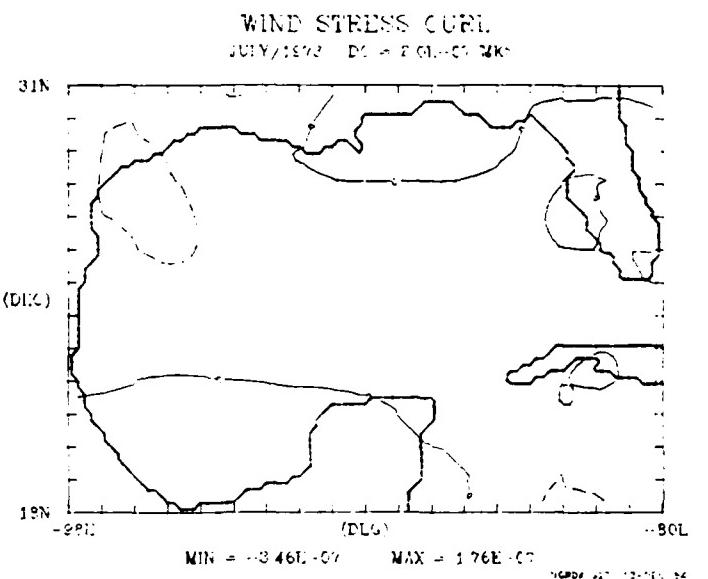
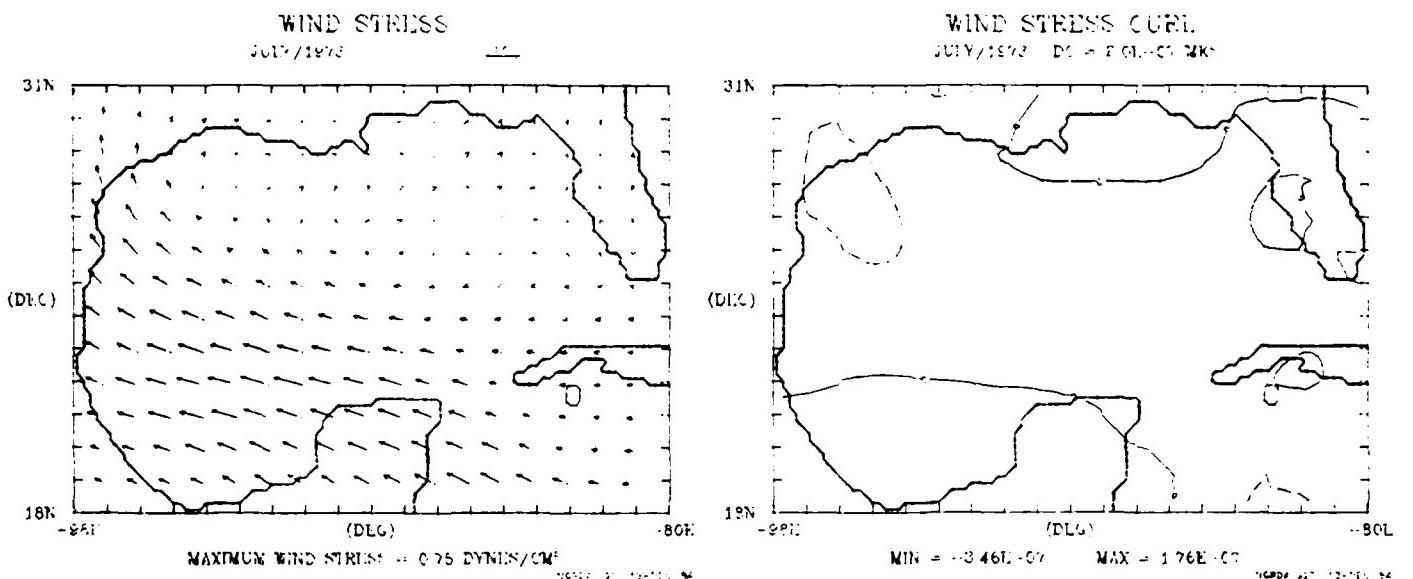
WIND STRESS
MARCH/1970



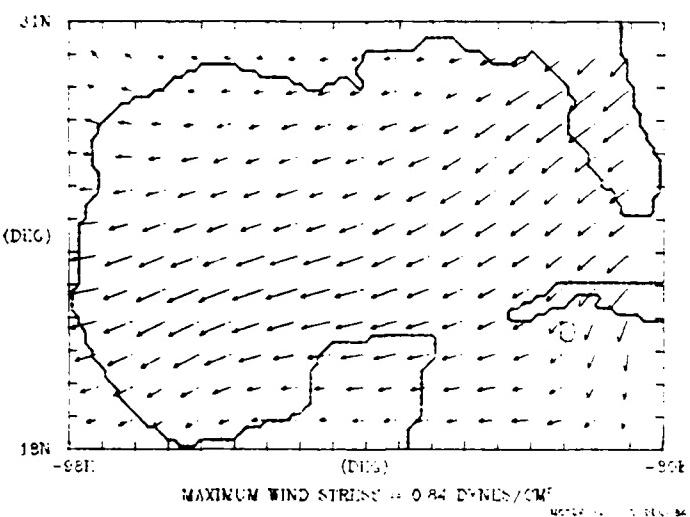
WIND STRESS CURL
MARCH/1970 DC = 2.01E-07 M/S



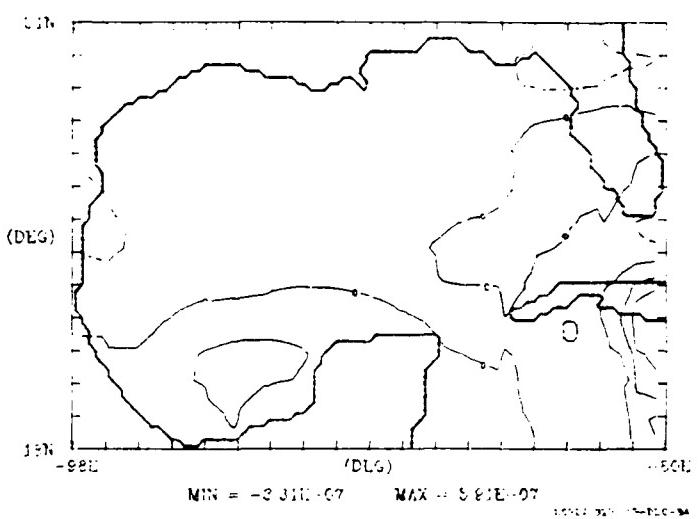




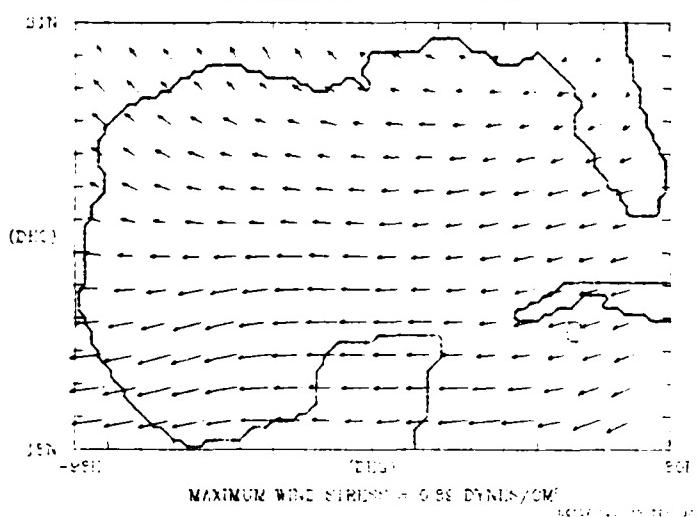
WIND STRESS
OCTOBER/1970



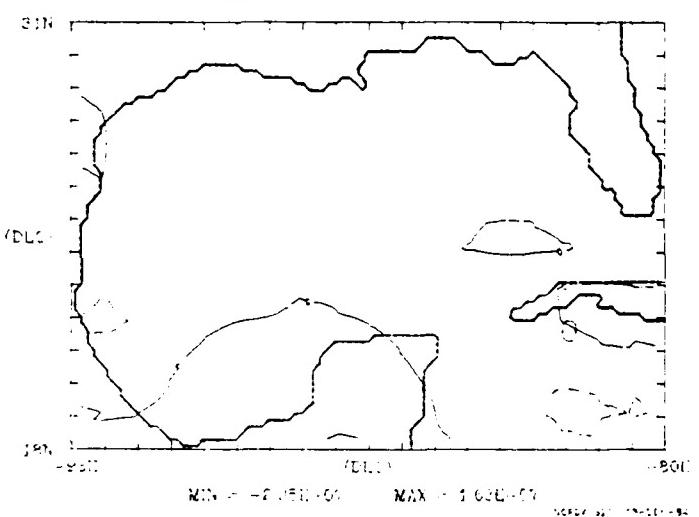
WIND STRESS CURL
OCTOBER/1970 DC = 2.0E-07 M/S



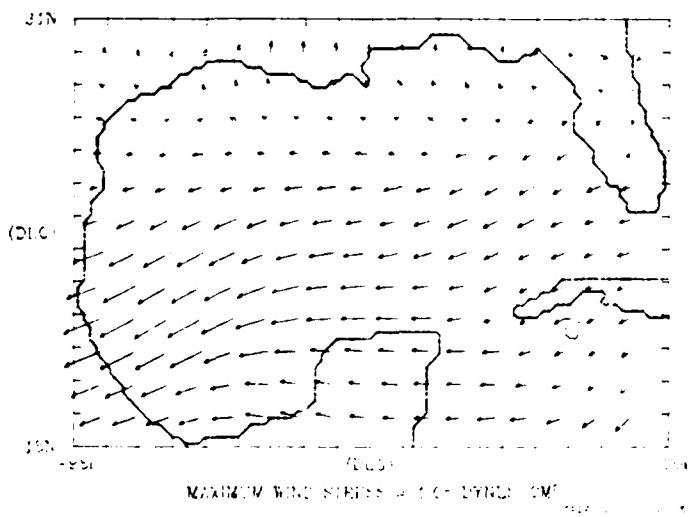
WIND STRESS
NOVEMBER/1970



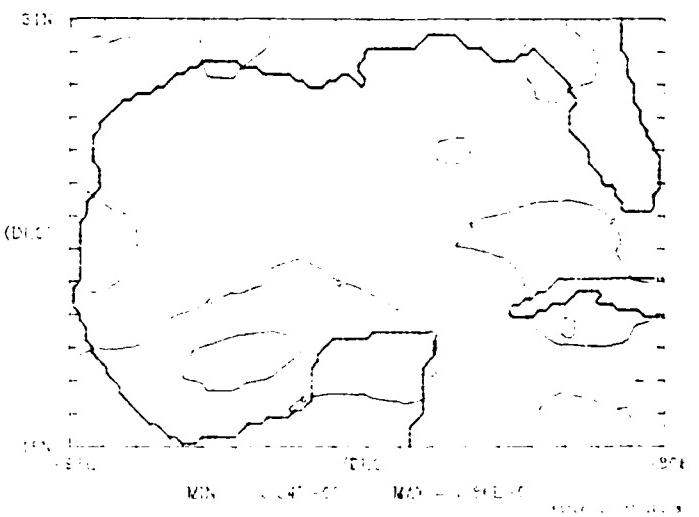
WIND STRESS CURL
NOVEMBER/1970 DC = 2.0E-07 M/S



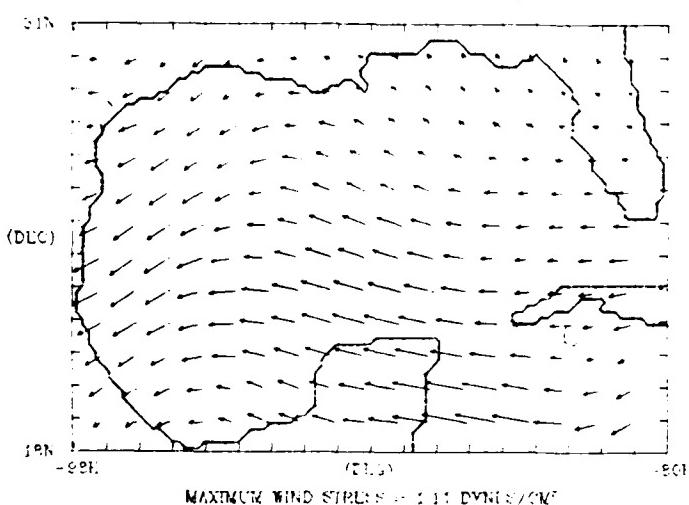
WIND STRESS
DECEMBER/1970



WIND STRESS CURL
DECEMBER/1970 DC = 2.0E-07 M/S

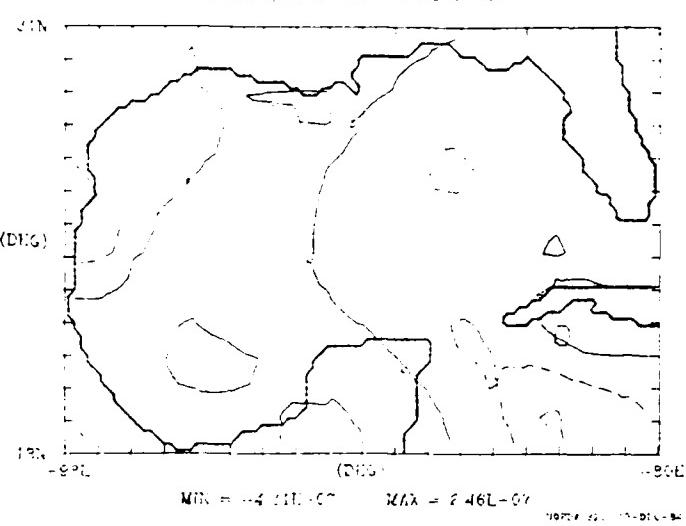


WIND STRESS
JANUARY 1974

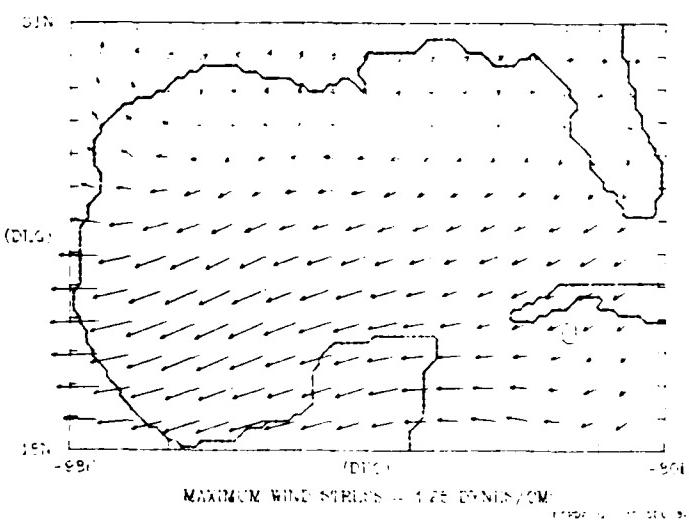


MAXIMUM WIND STRESS = 1.11 DYNES/CM²

WIND STRESS CURL
JANUARY 1974 DC = 2.0E-07 MKS

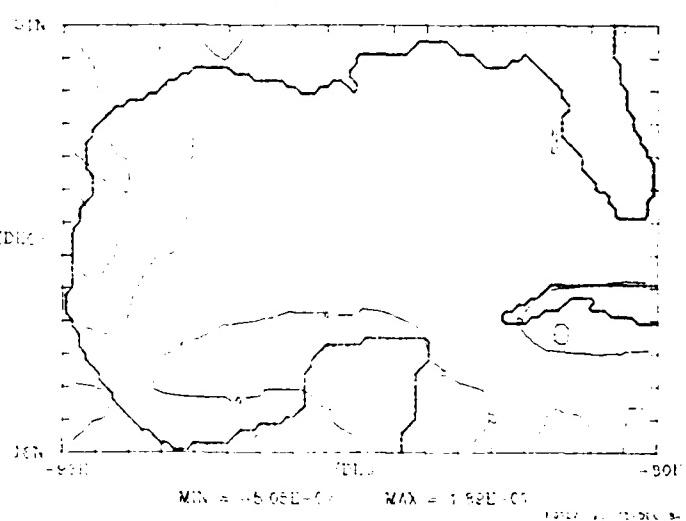


WIND STRESS
FEBRUARY 1974

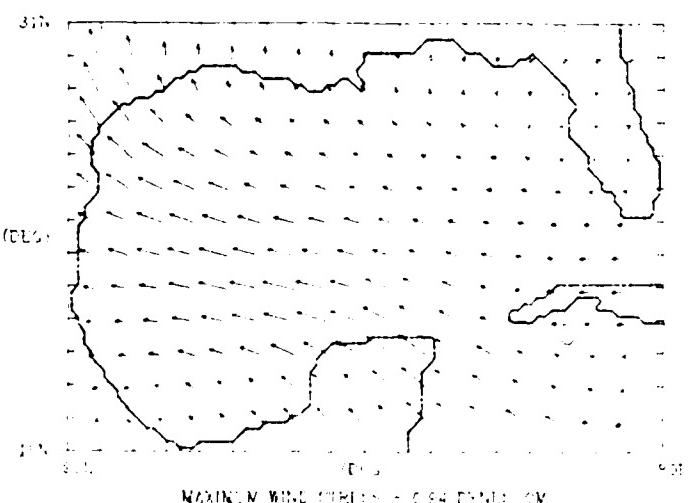


MAXIMUM WIND STRESS = 1.25 DYNES/CM²

WIND STRESS CURL
FEBRUARY 1974 DC = 2.0E-07 MKS

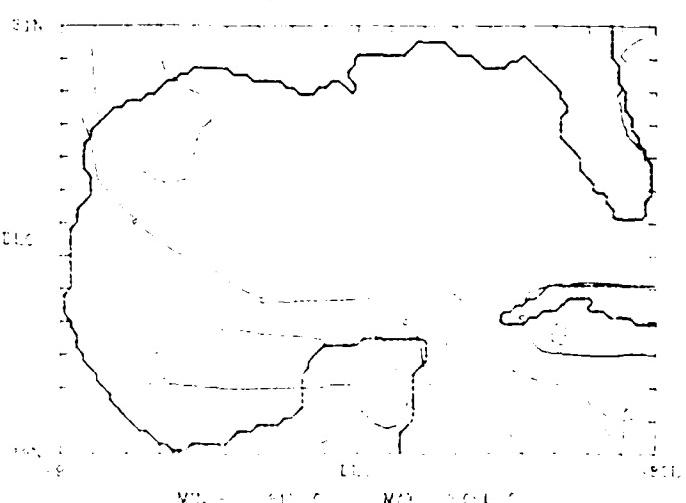


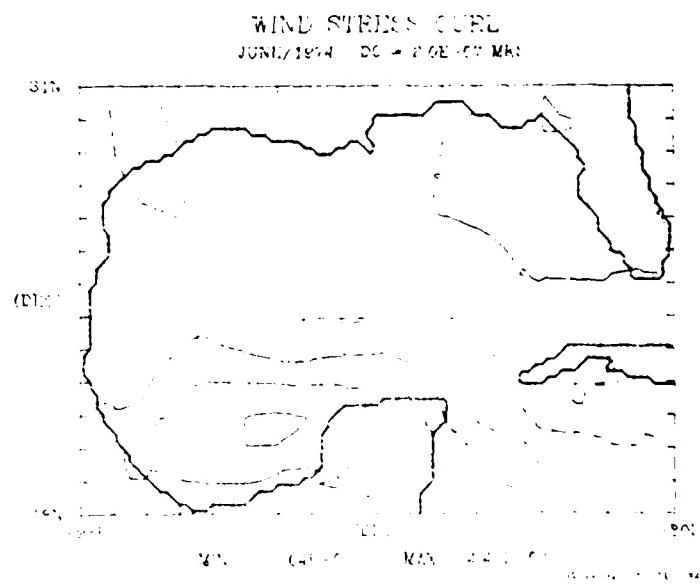
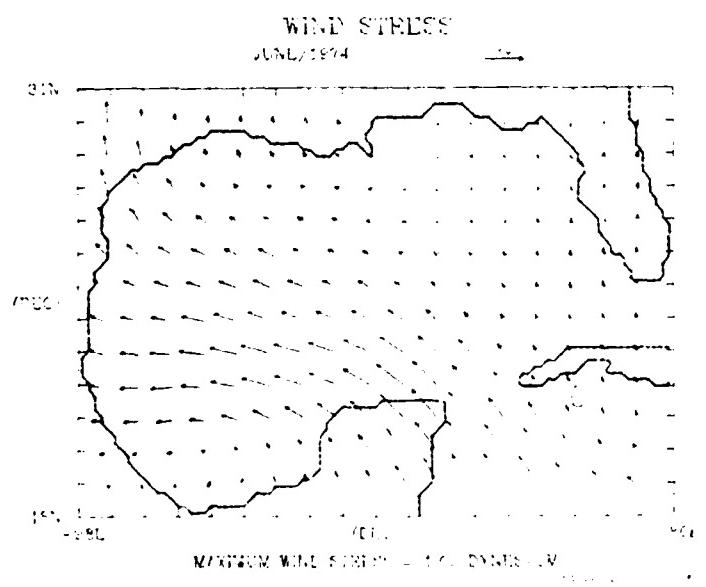
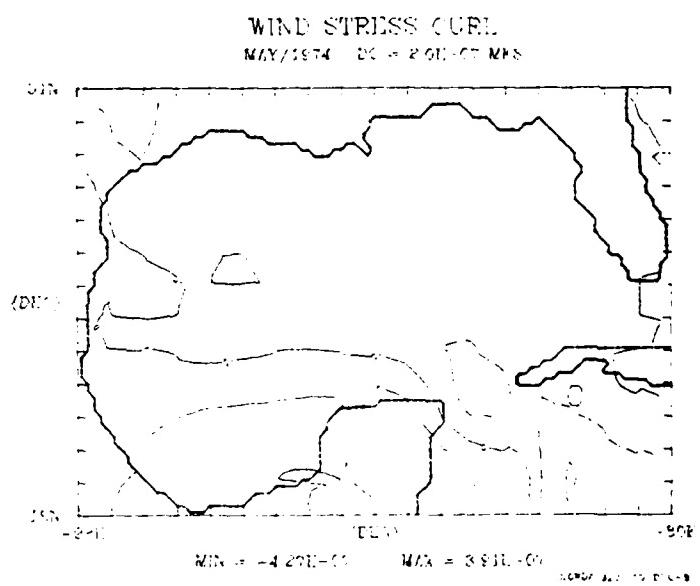
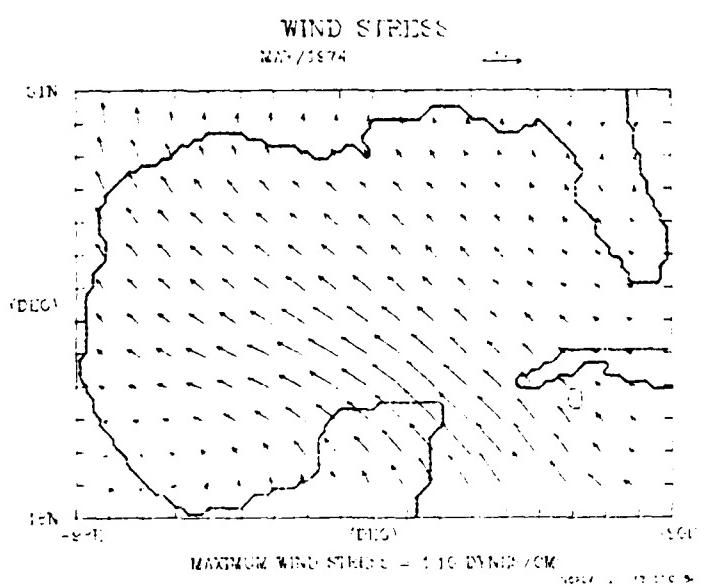
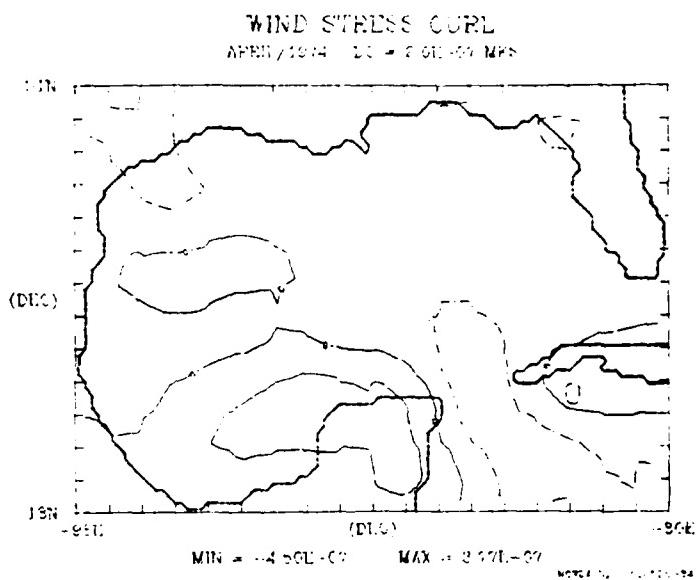
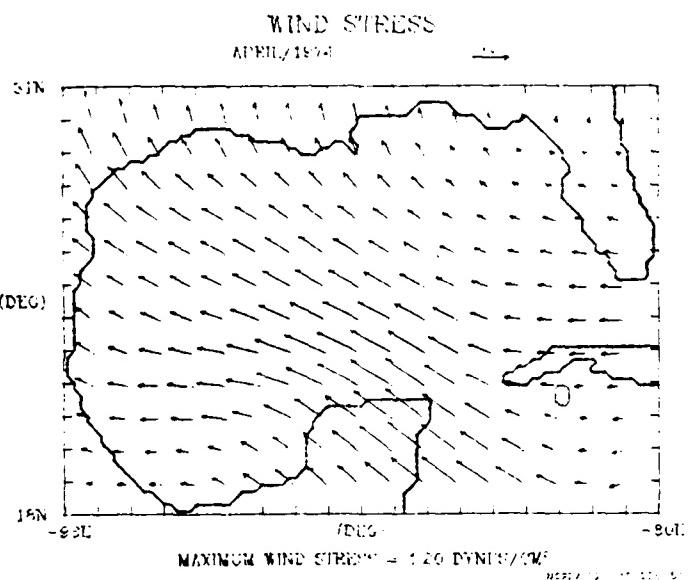
WIND STRESS
MARCH 1974



MAXIMUM WIND STRESS = 0.94 DYNES/CM²

WIND STRESS CURL
MARCH 1974 DC = 2.0E-07 MKS

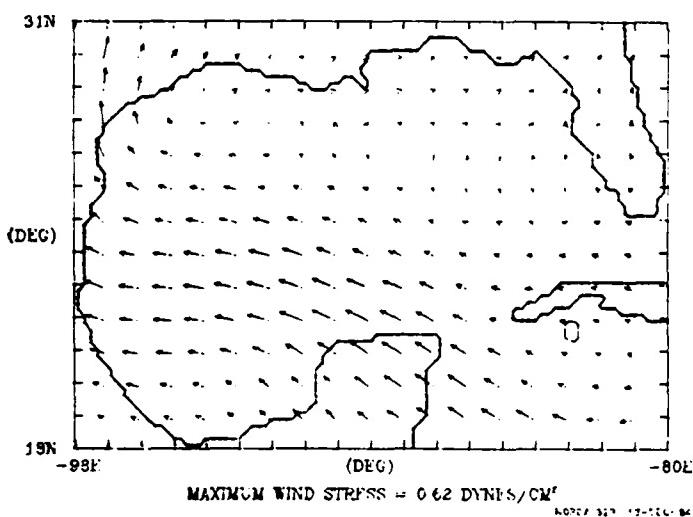




WIND STRESS

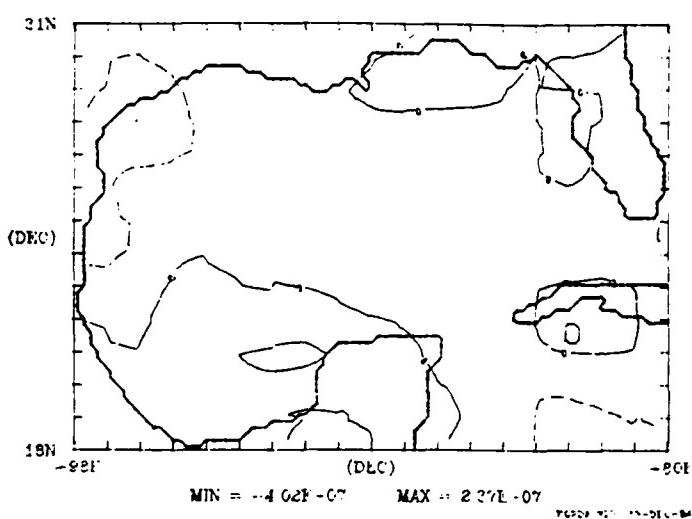
JULY/1974

10



WIND STRESS CURL

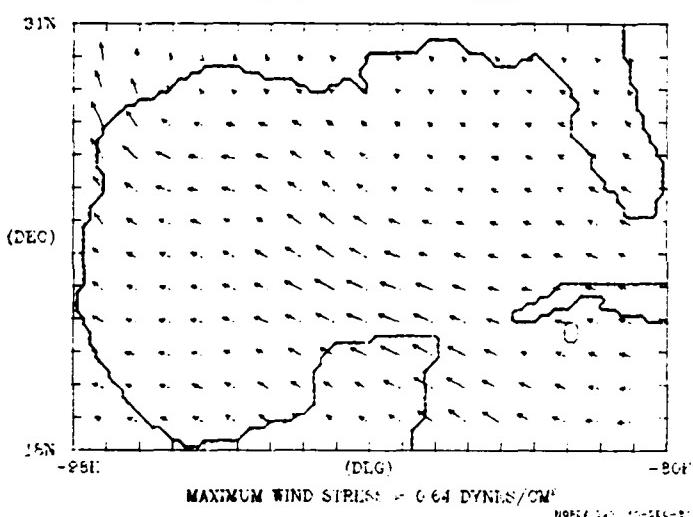
JULY/1974 DC = 2.0E-07 MKS



WIND STRESS

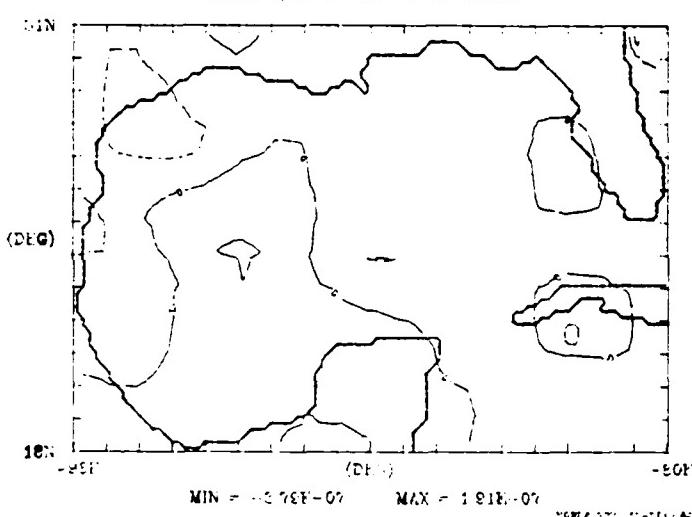
AUGUST/1974

10



WIND STRESS CURL

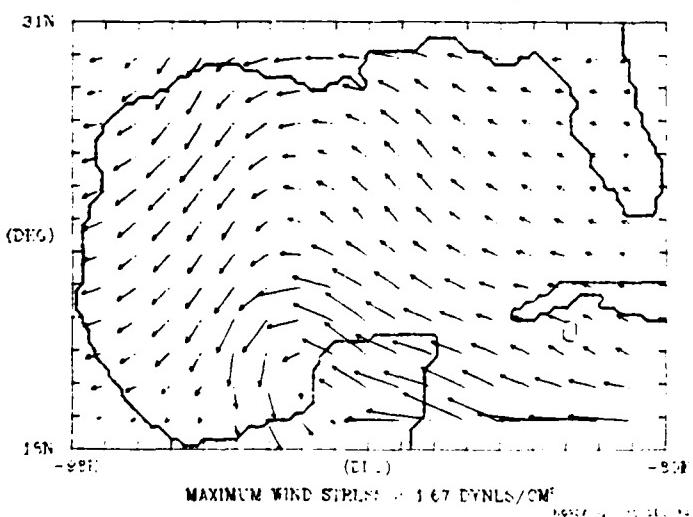
AUGUST/1974 DC = 2.0E-07 MKS



WIND STRESS

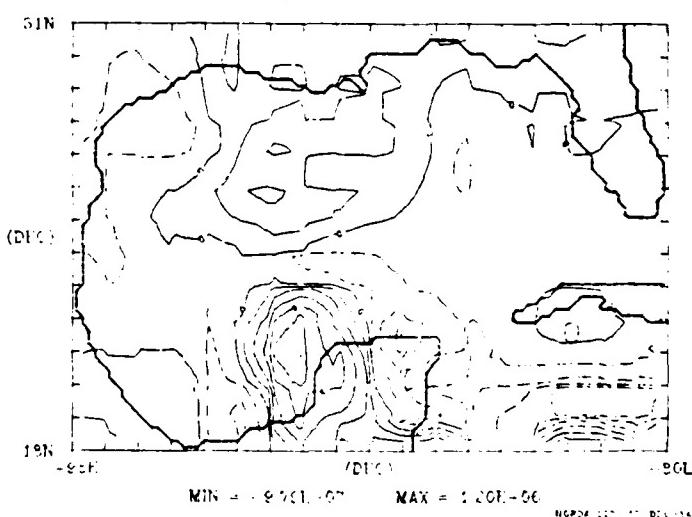
SEPTEMBER/1974

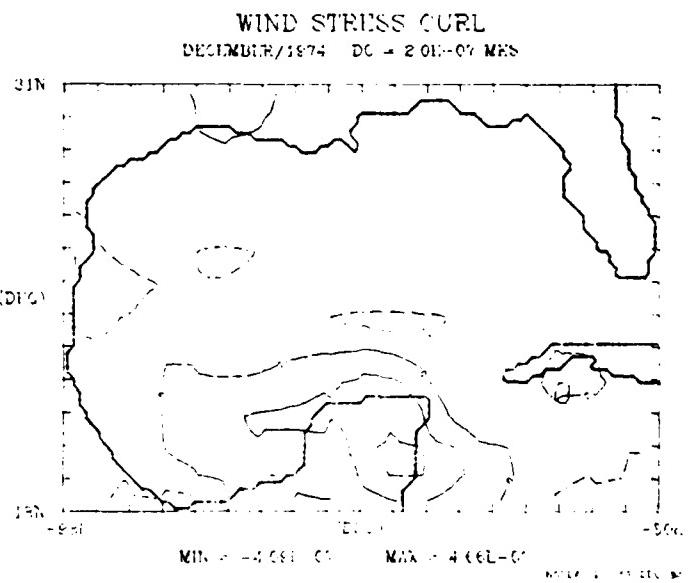
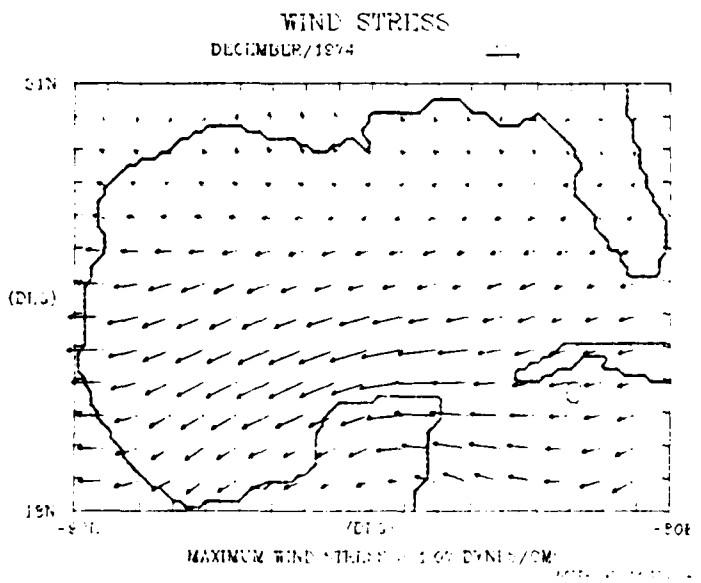
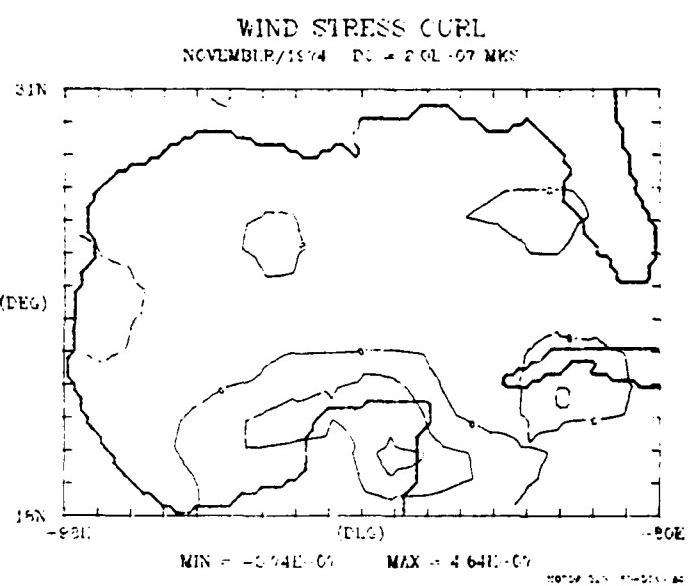
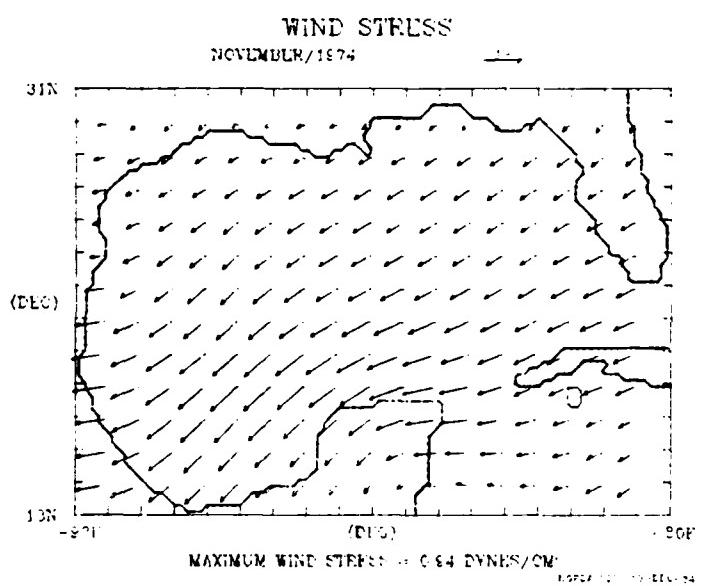
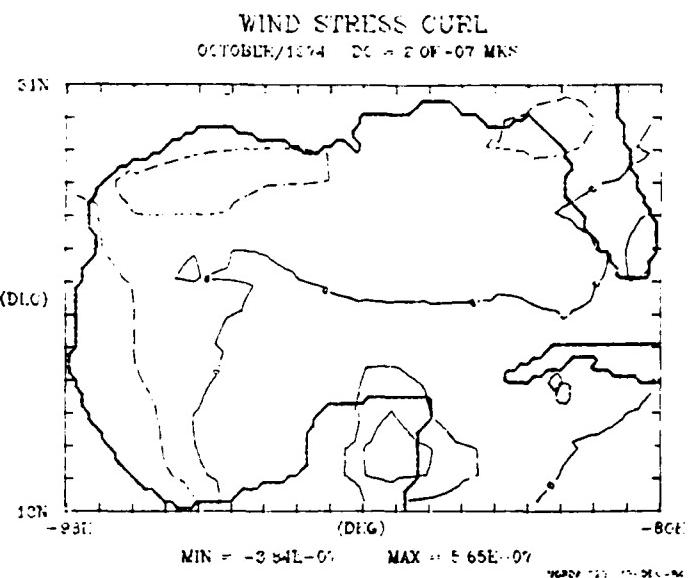
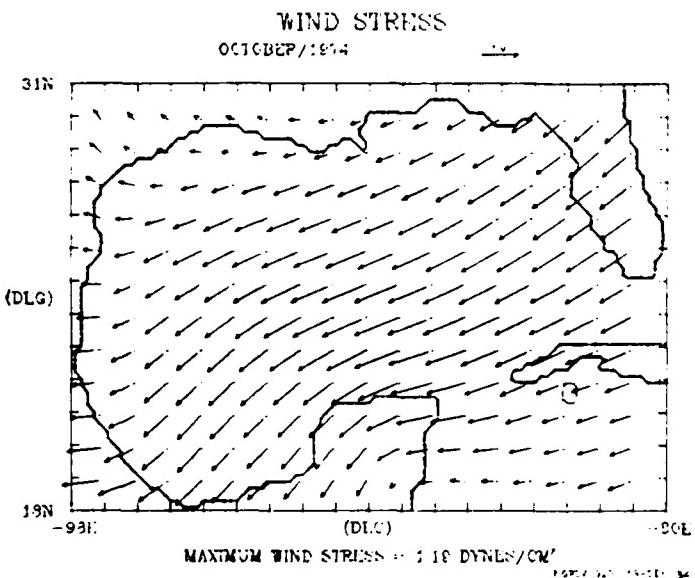
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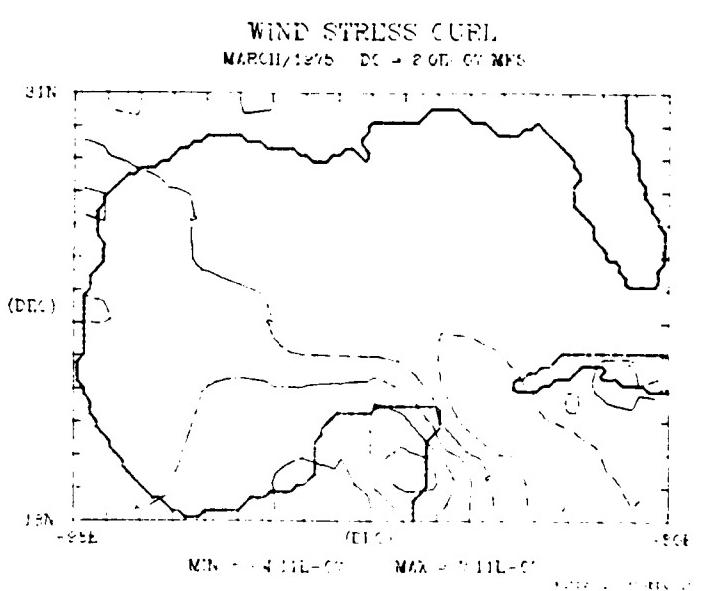
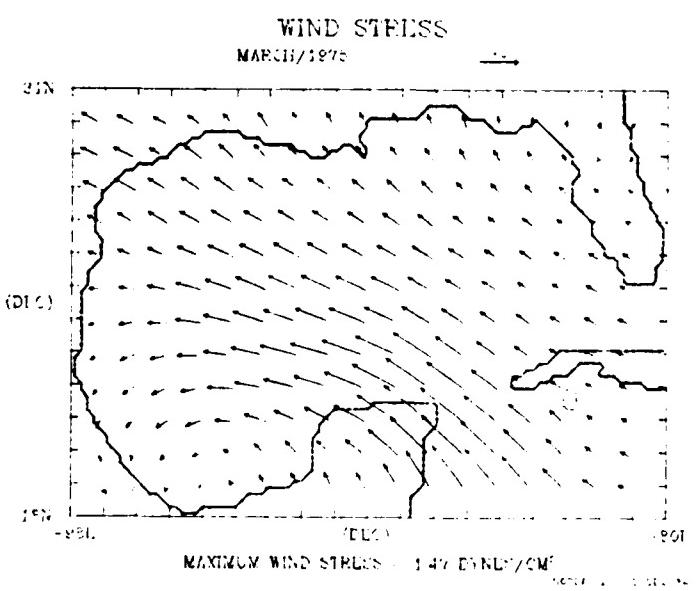
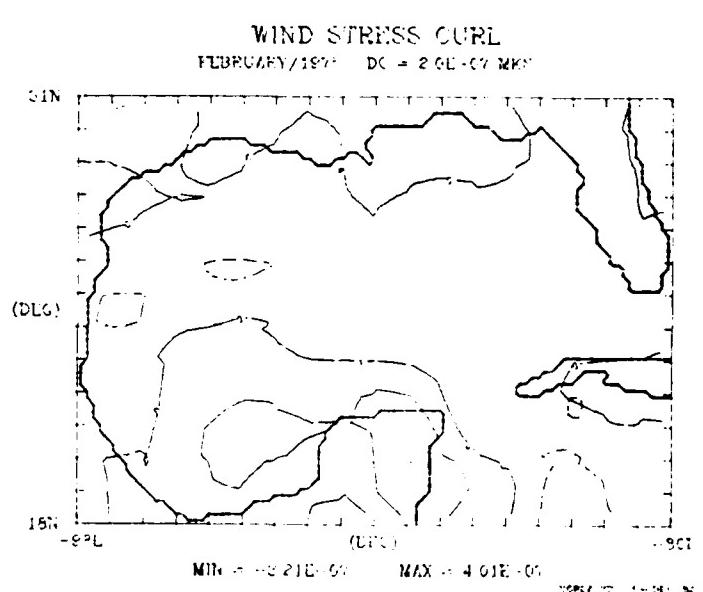
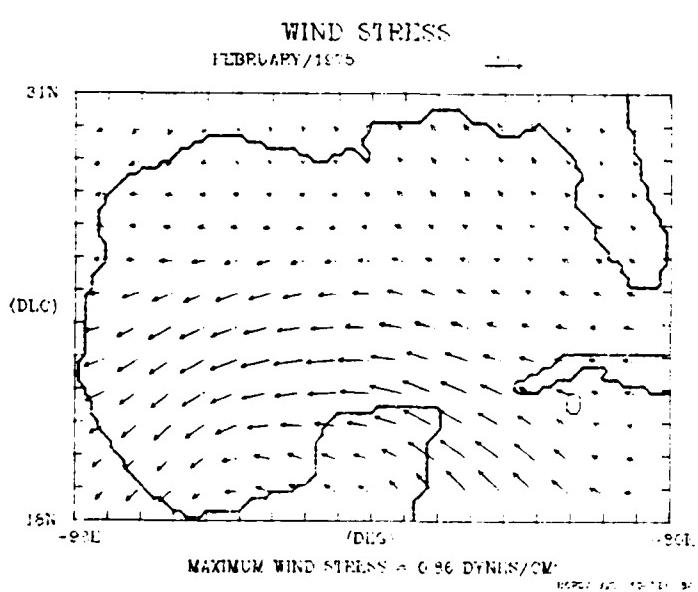
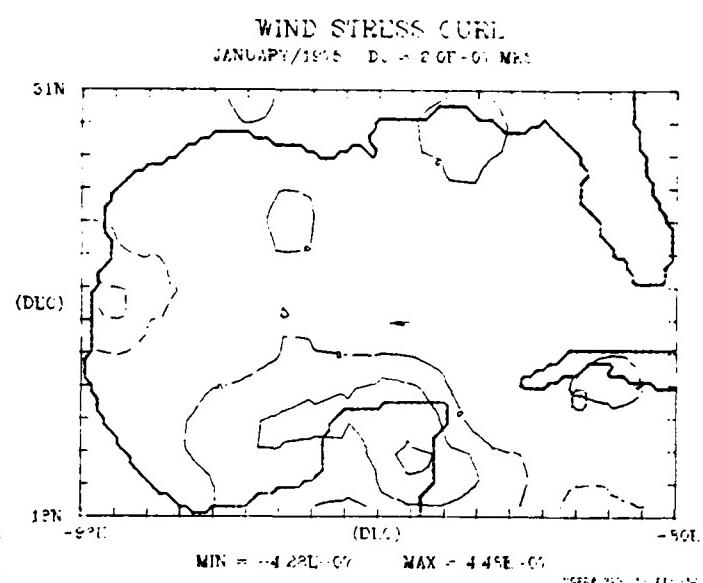
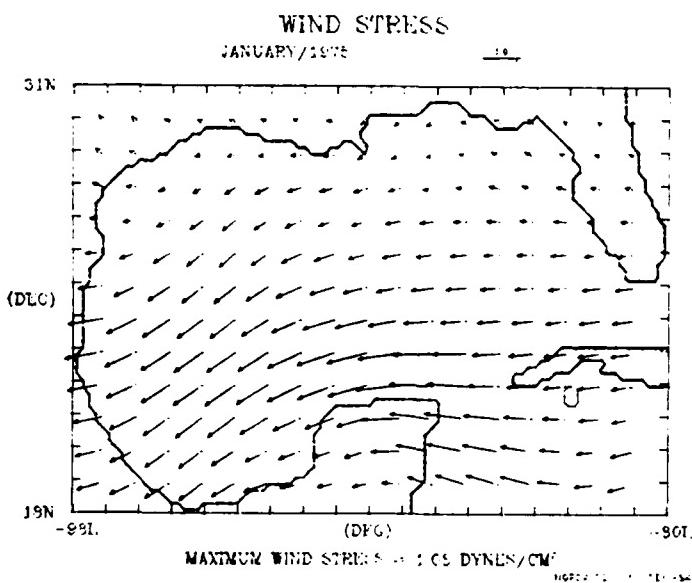


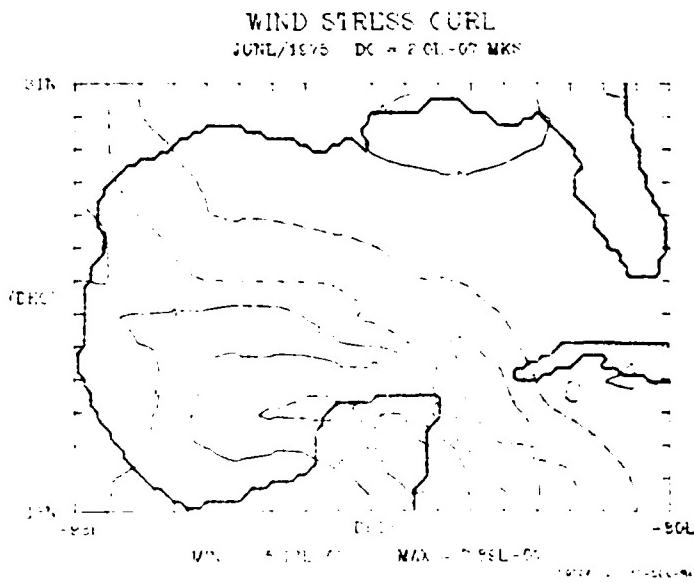
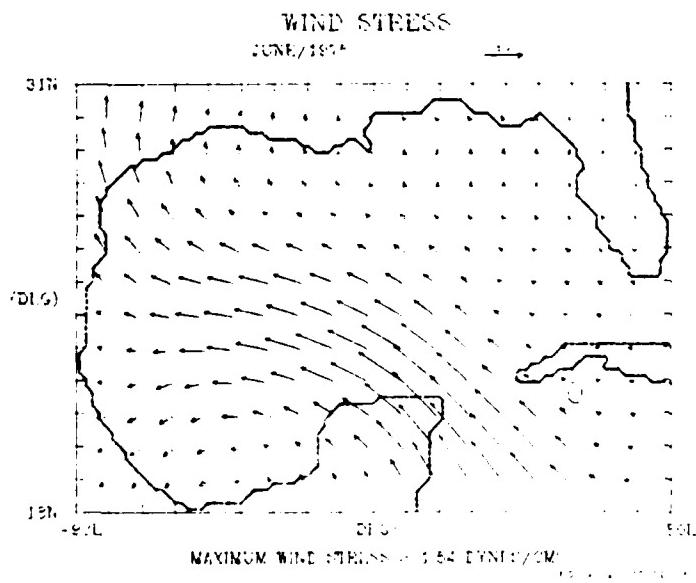
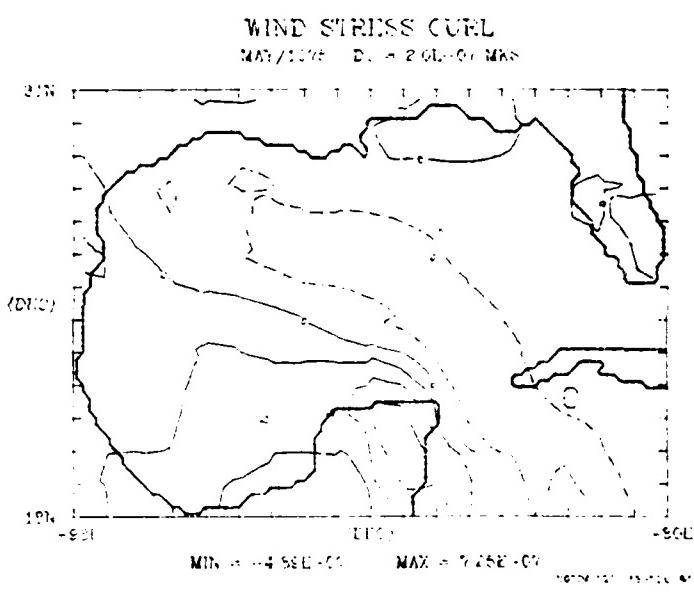
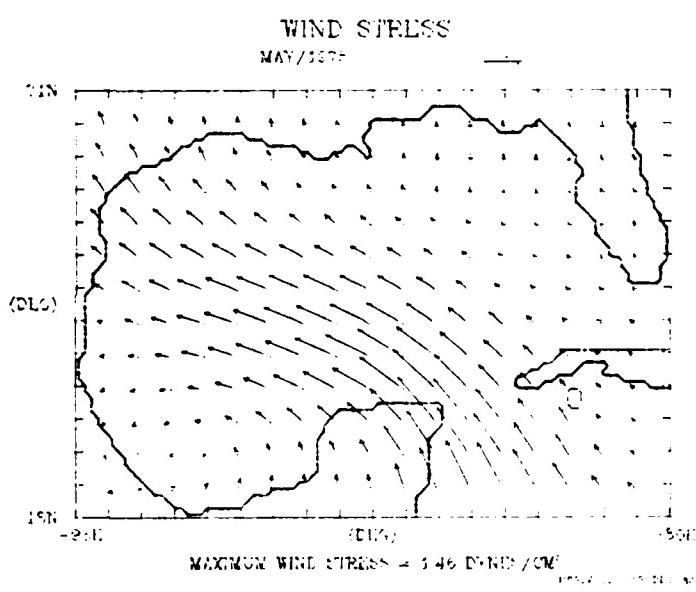
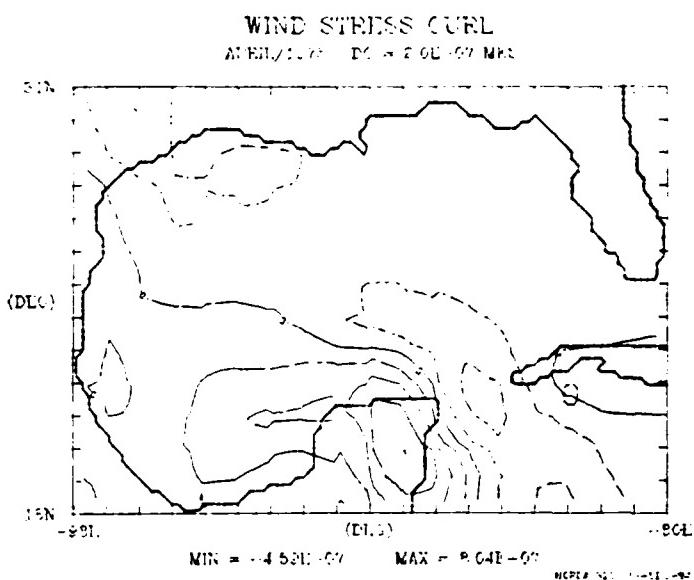
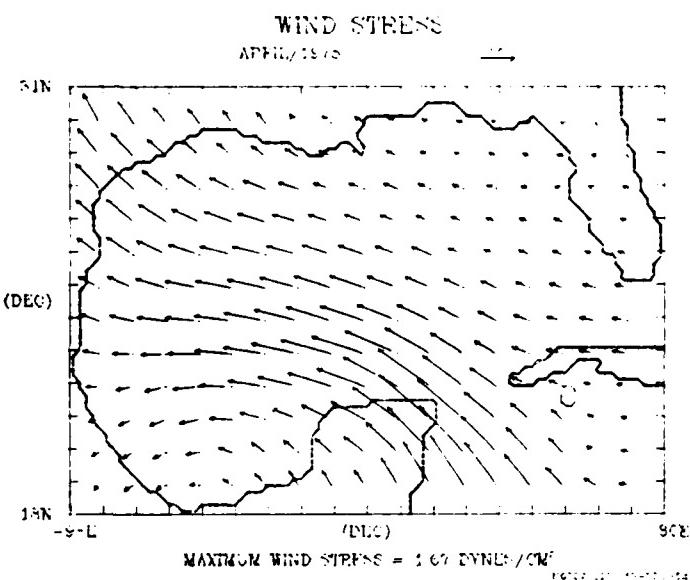
WIND STRESS CURL

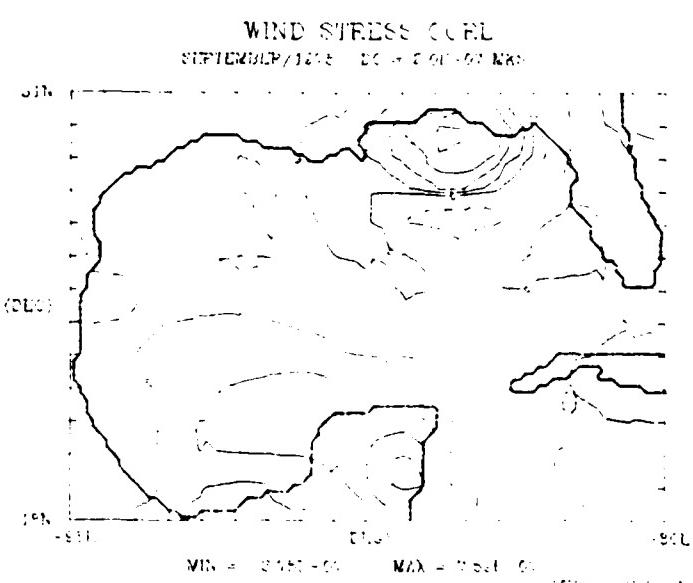
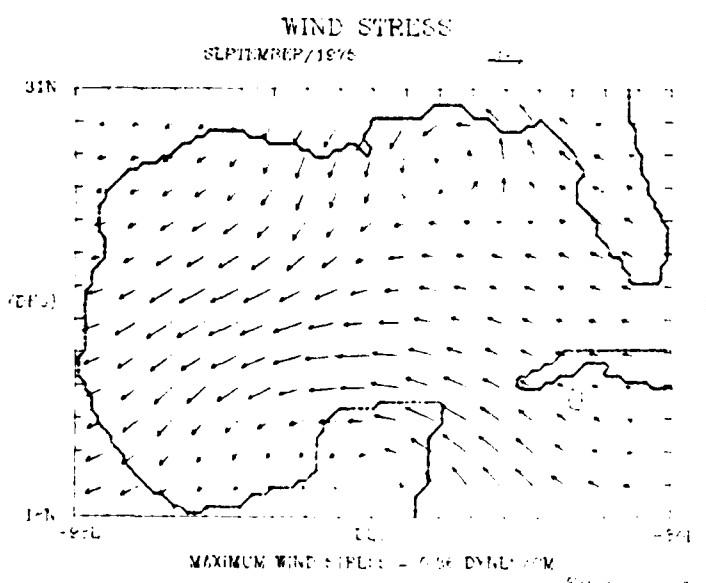
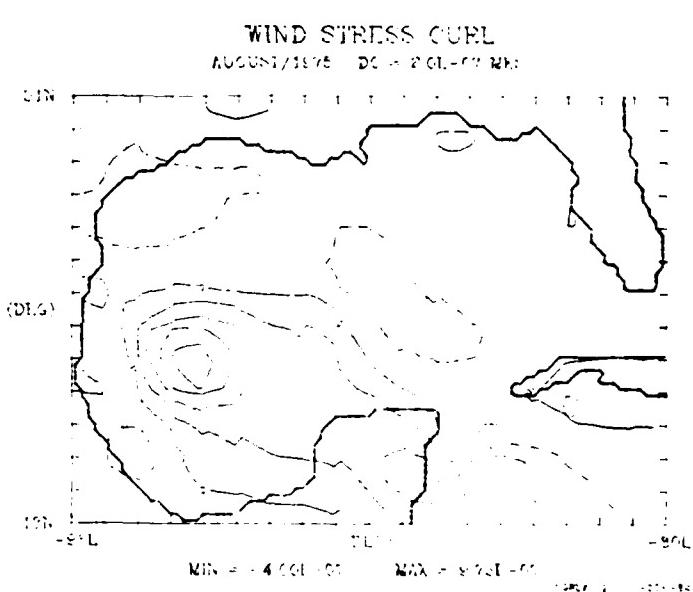
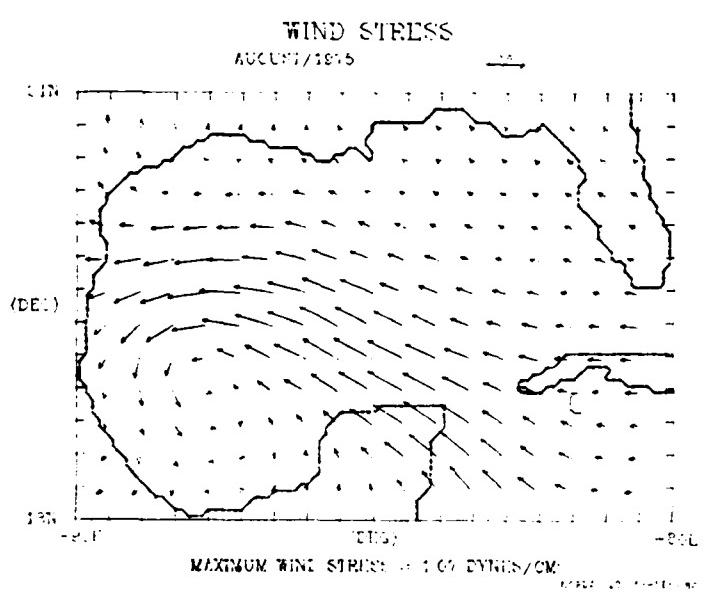
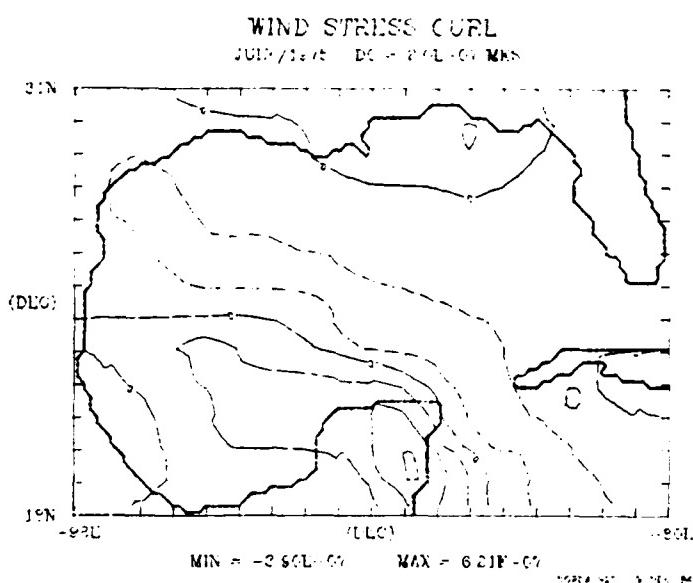
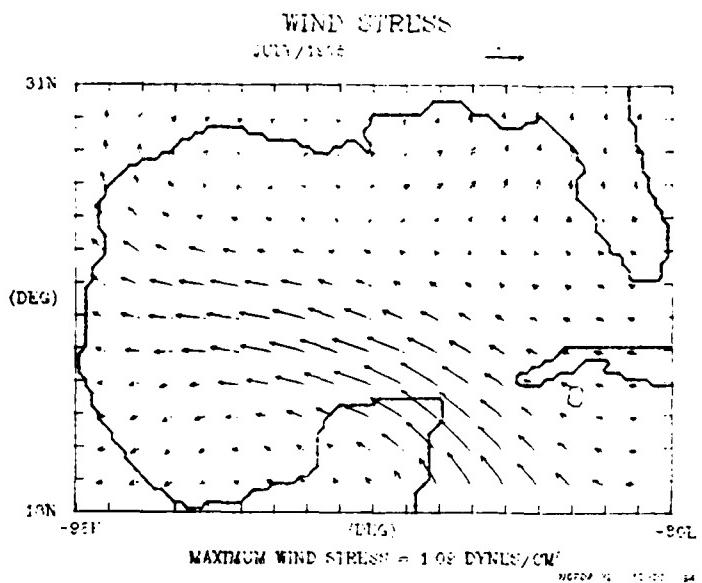
SEPTEMBER/1974 DC = 2.0E-07 MKS

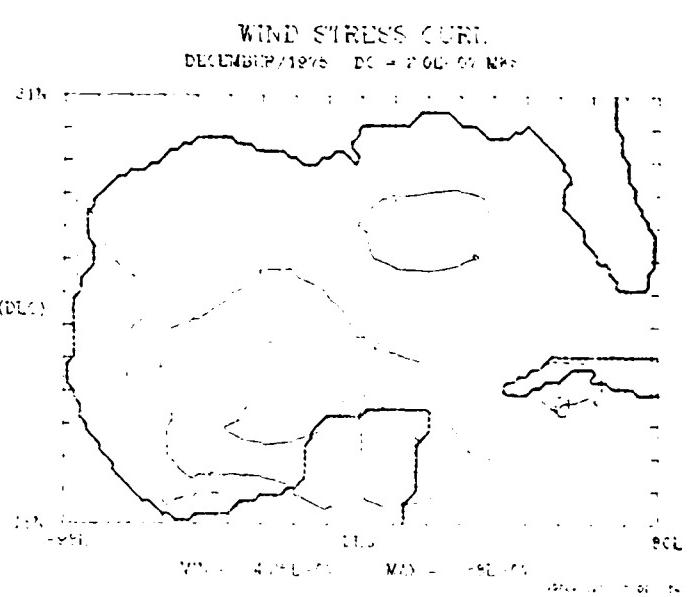
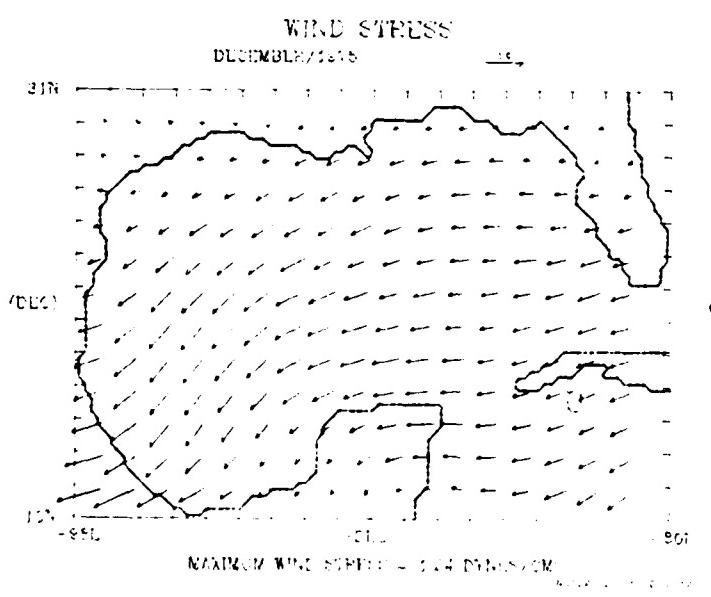
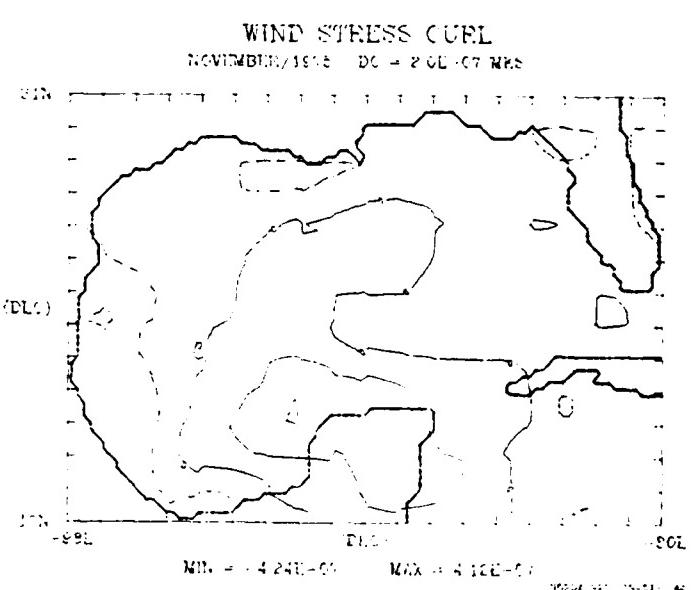
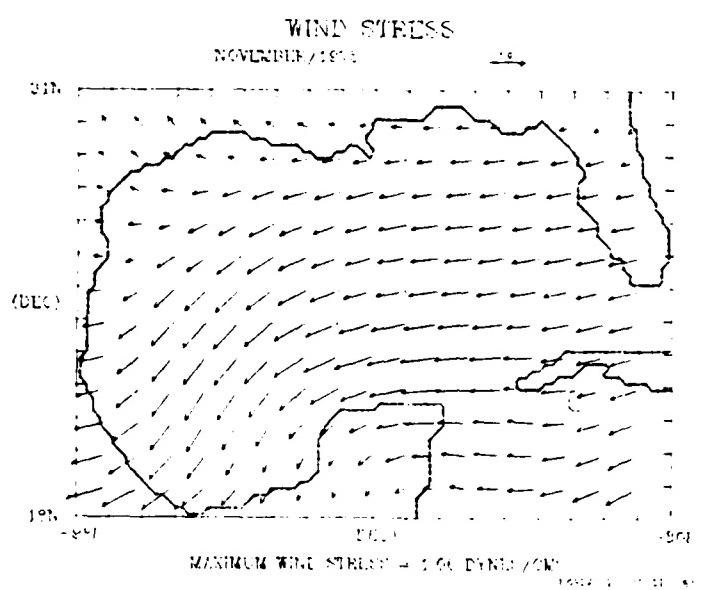
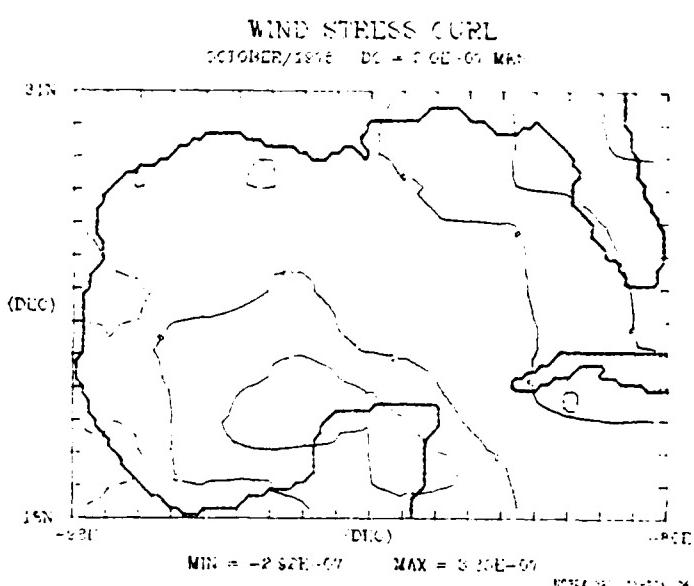
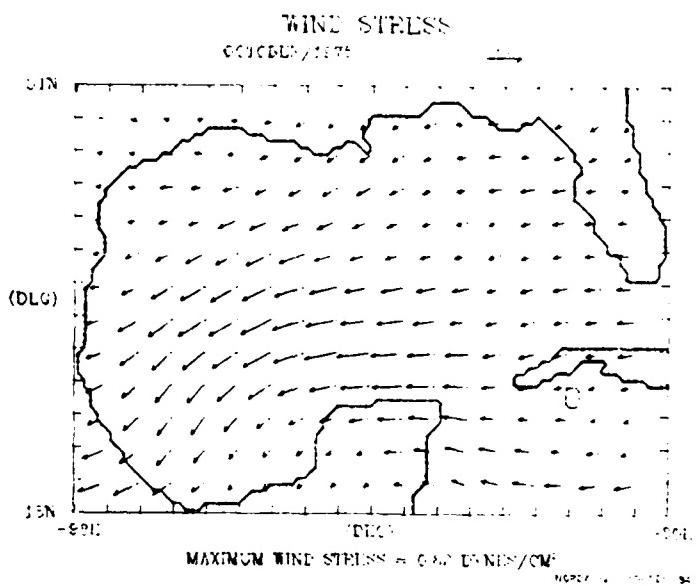


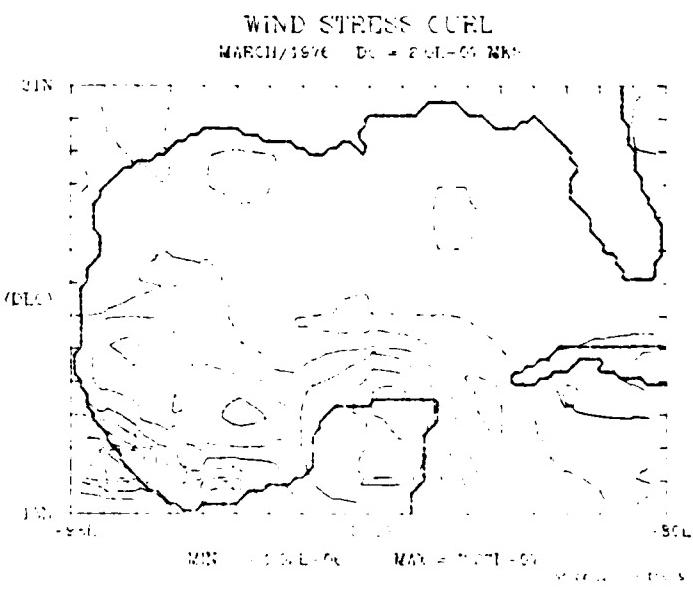
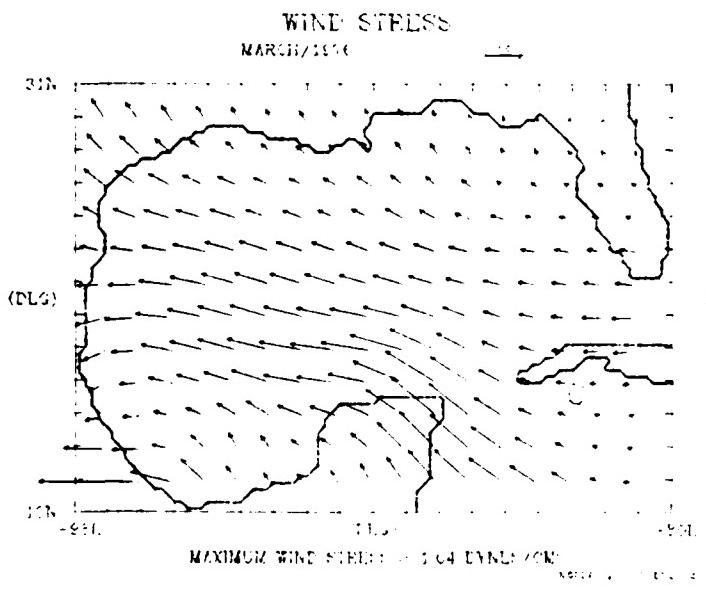
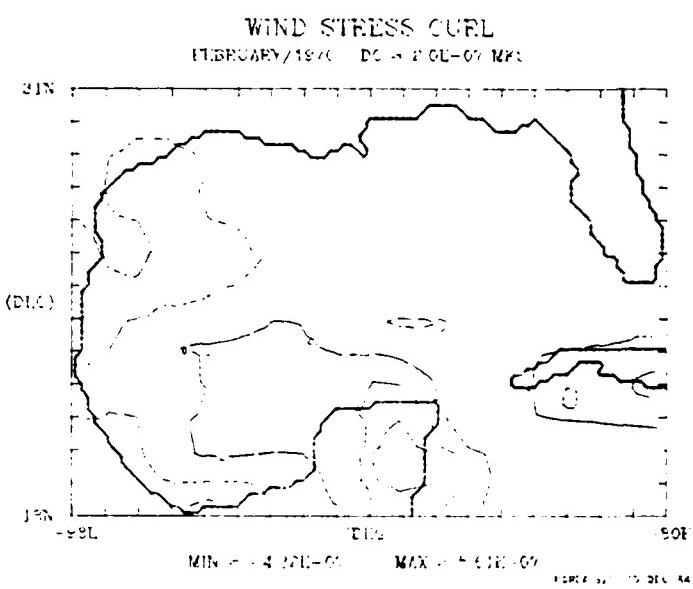
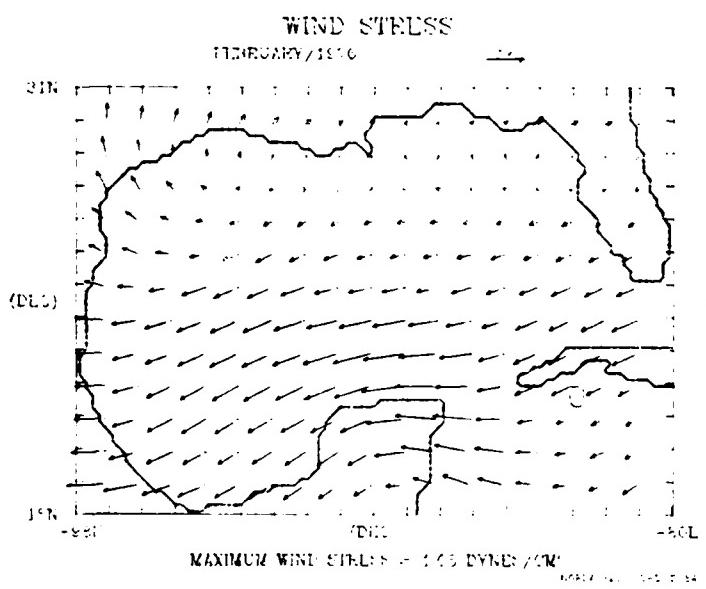
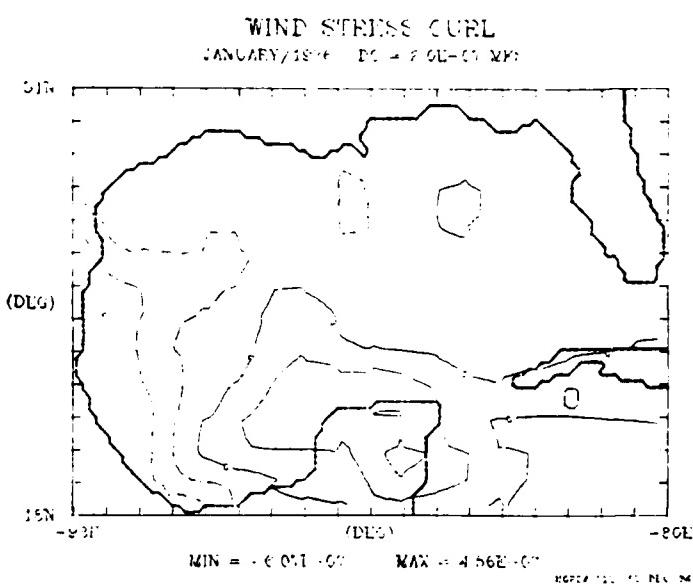
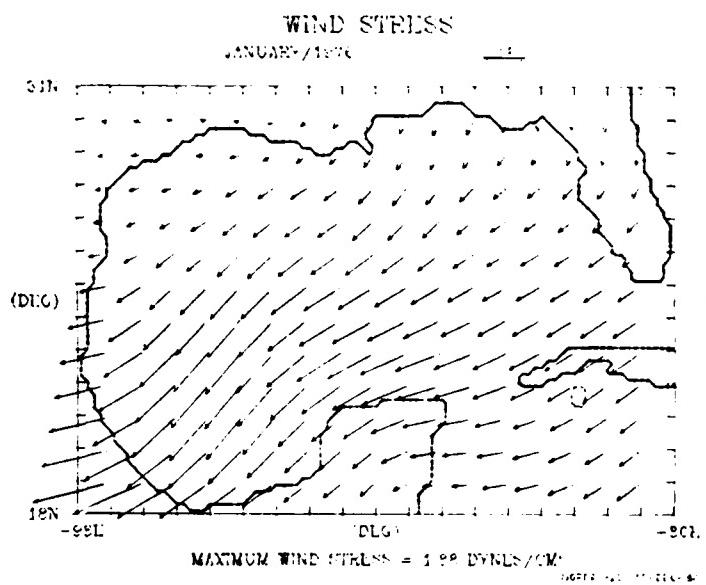


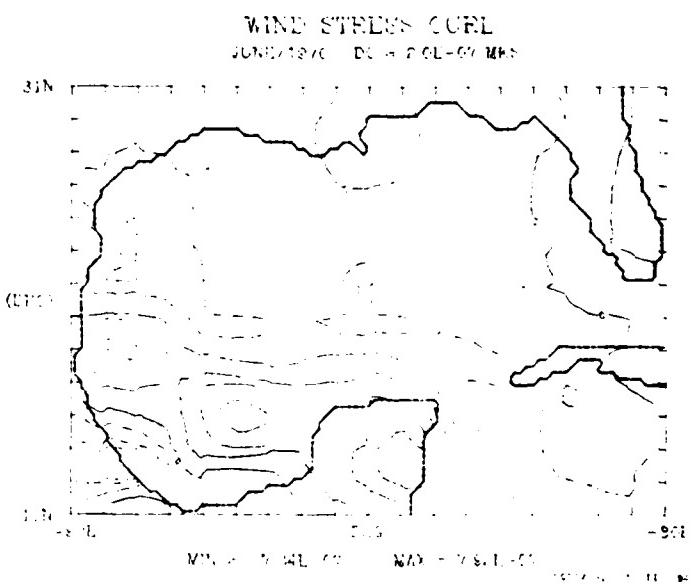
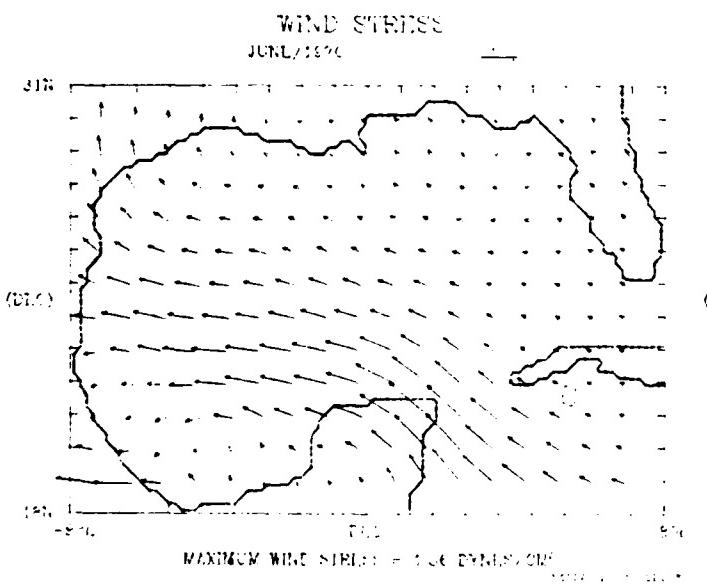
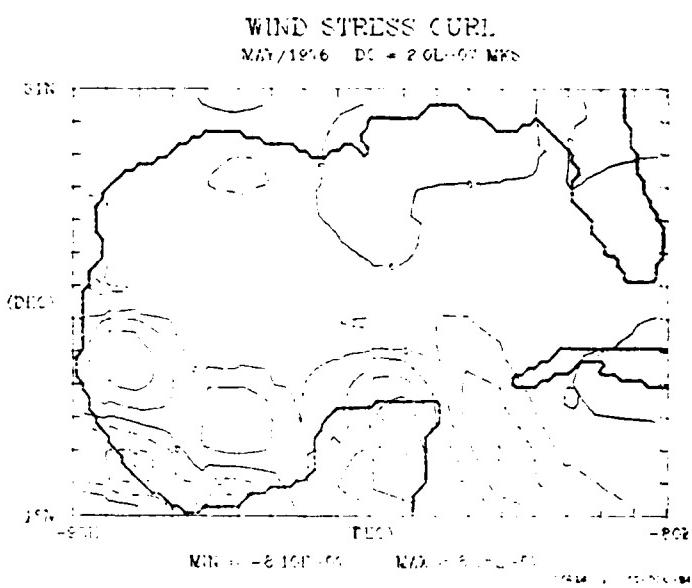
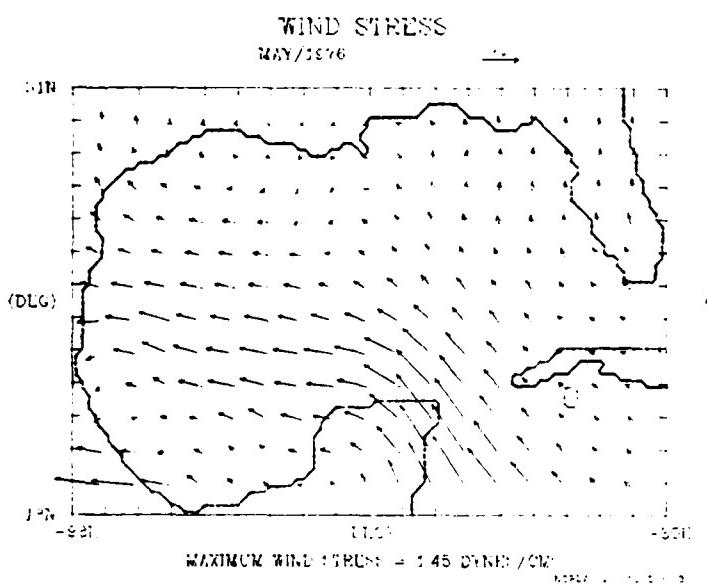
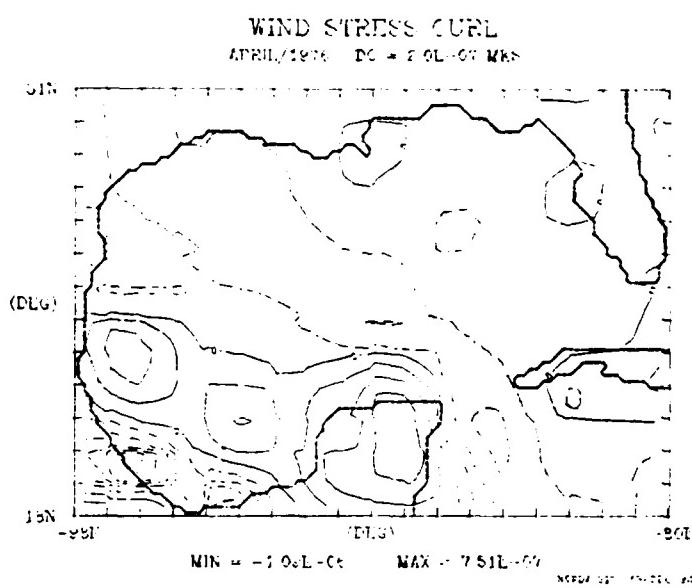
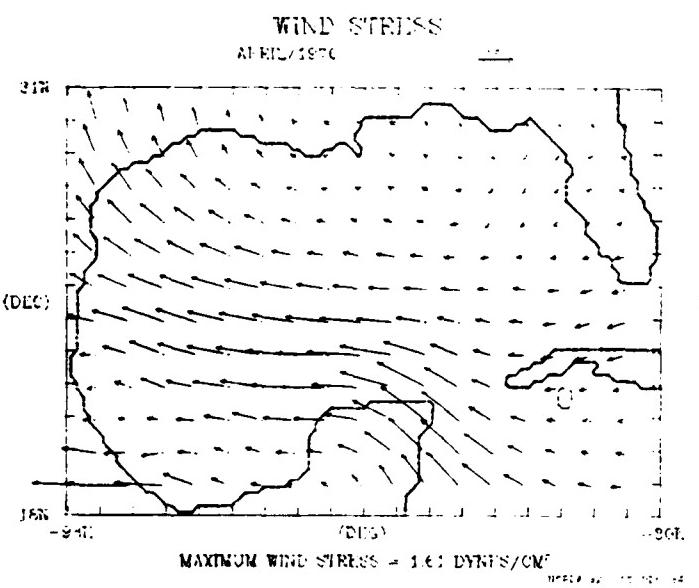


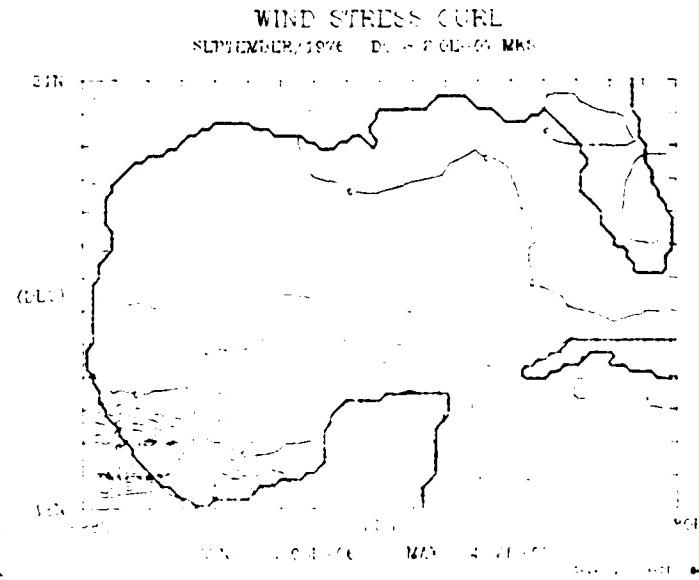
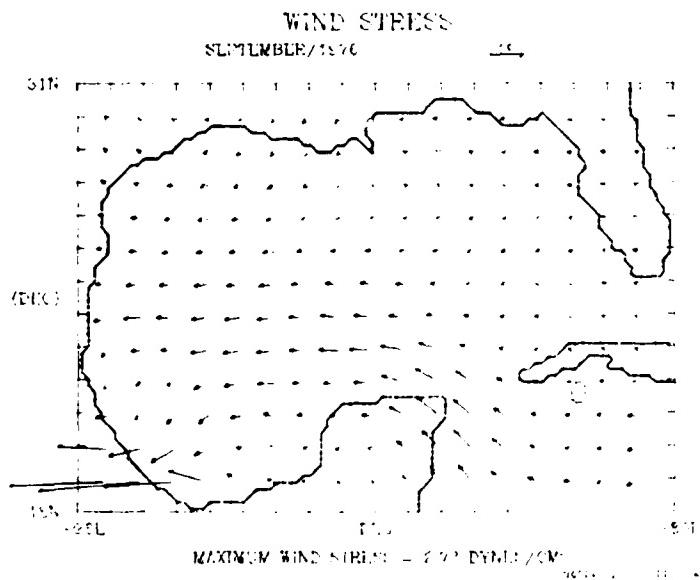
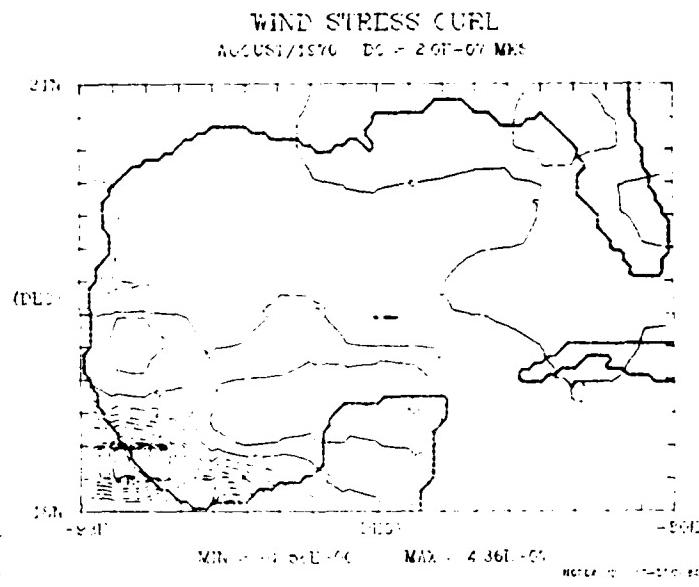
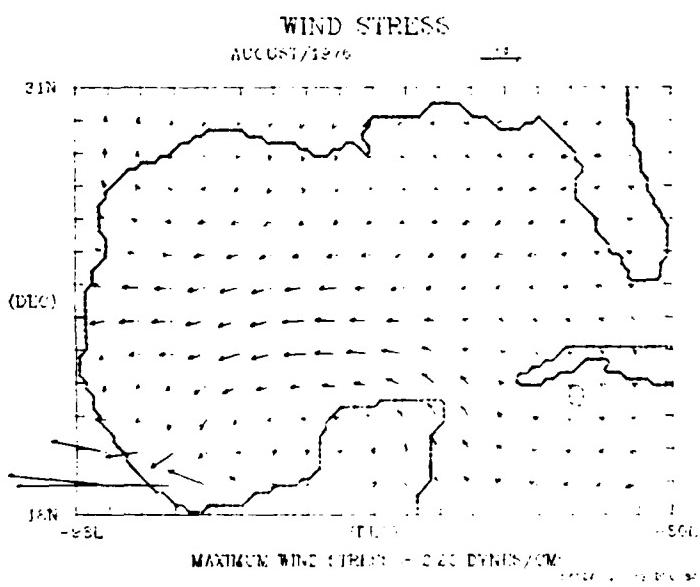
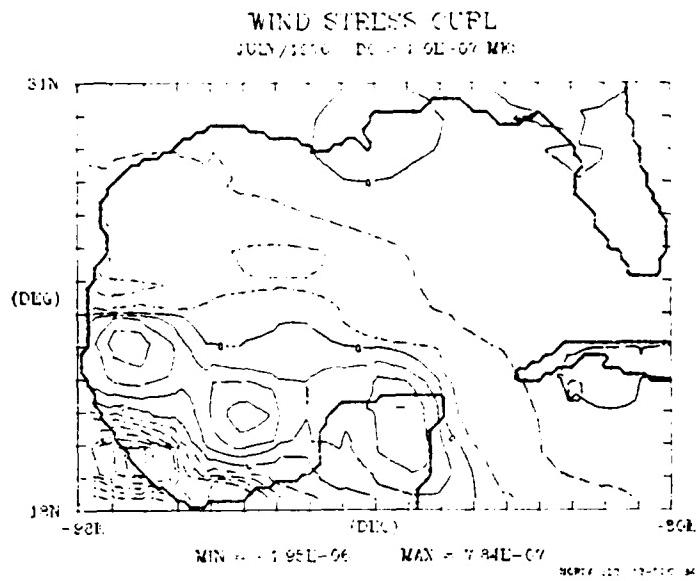
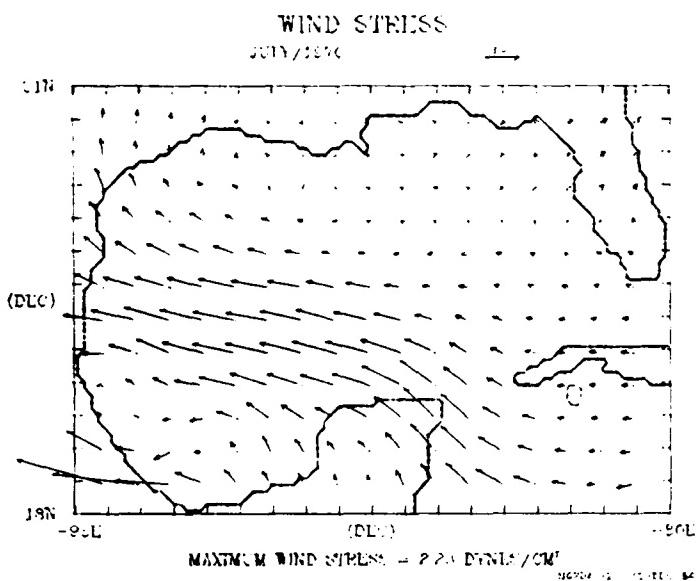


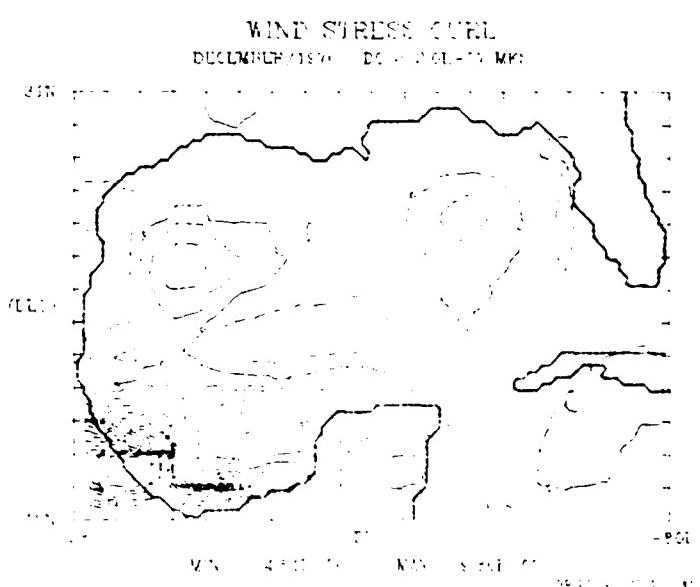
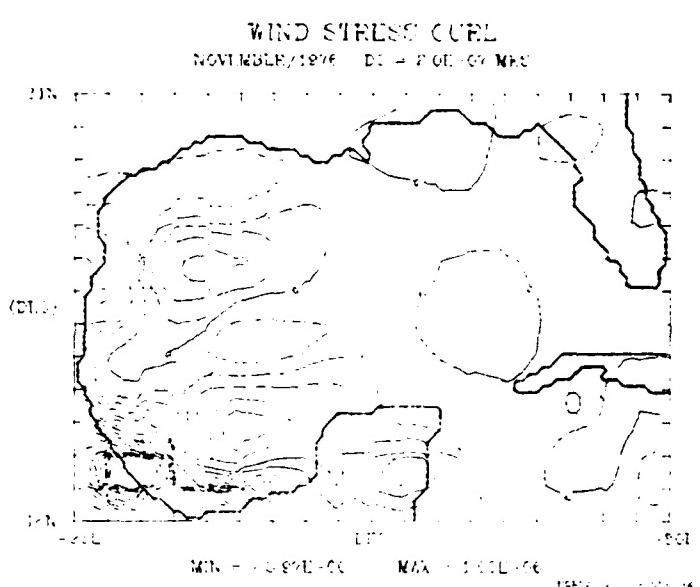
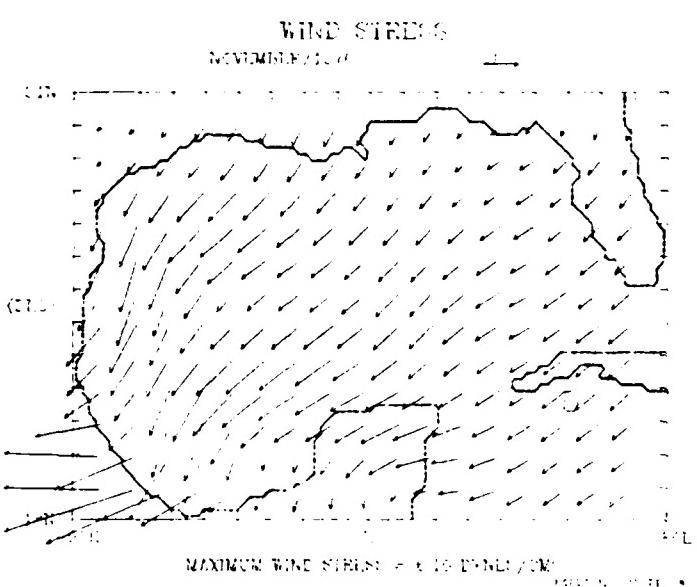
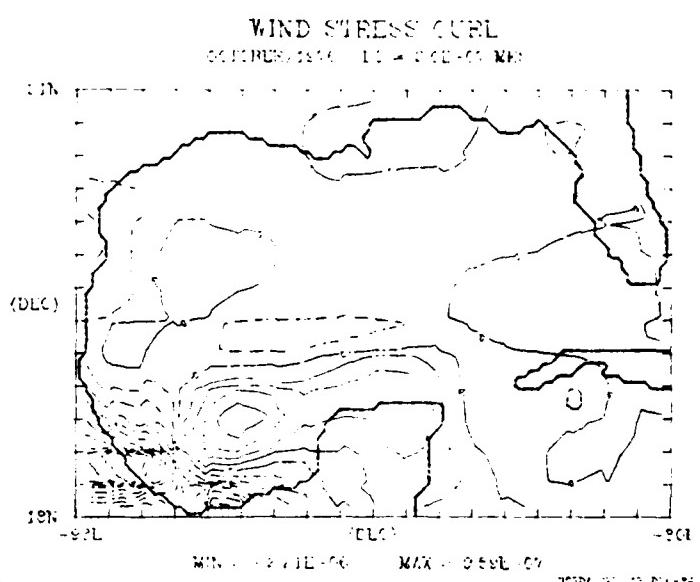
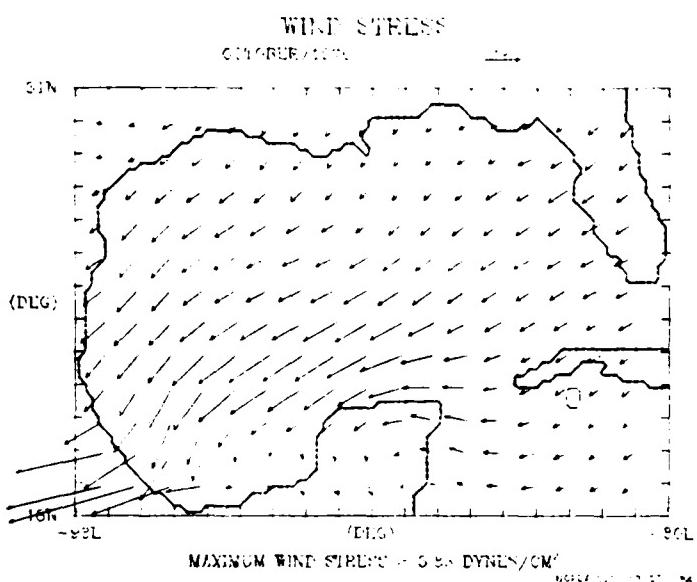


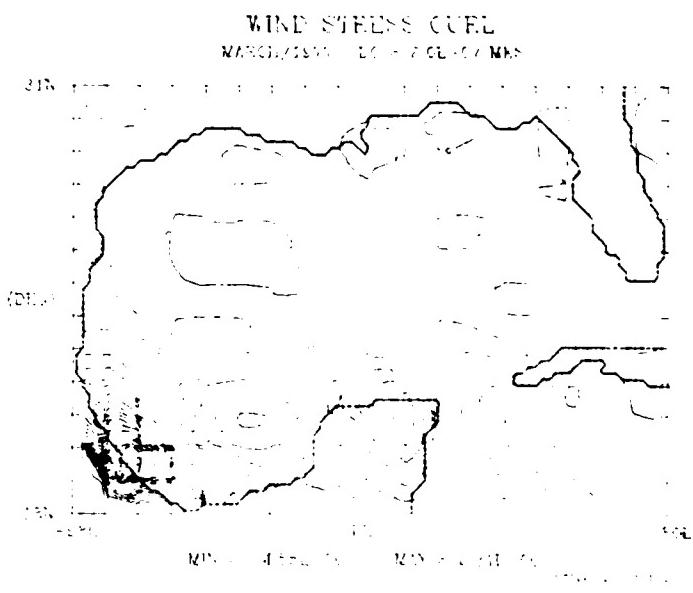
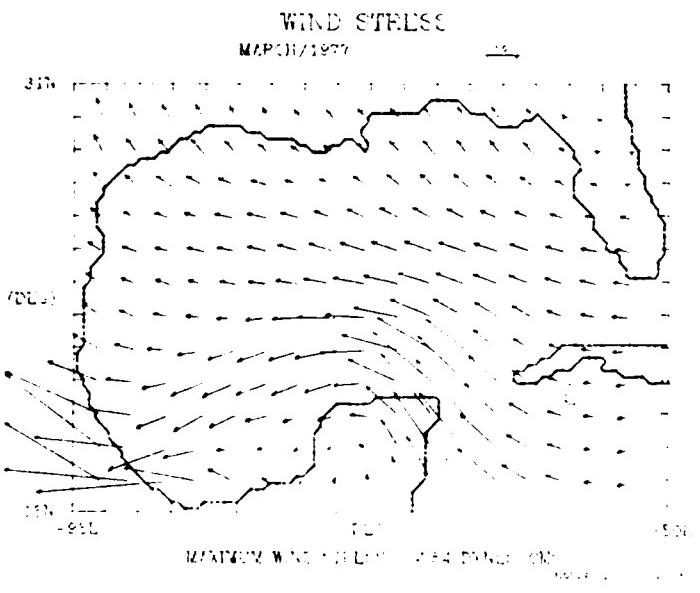
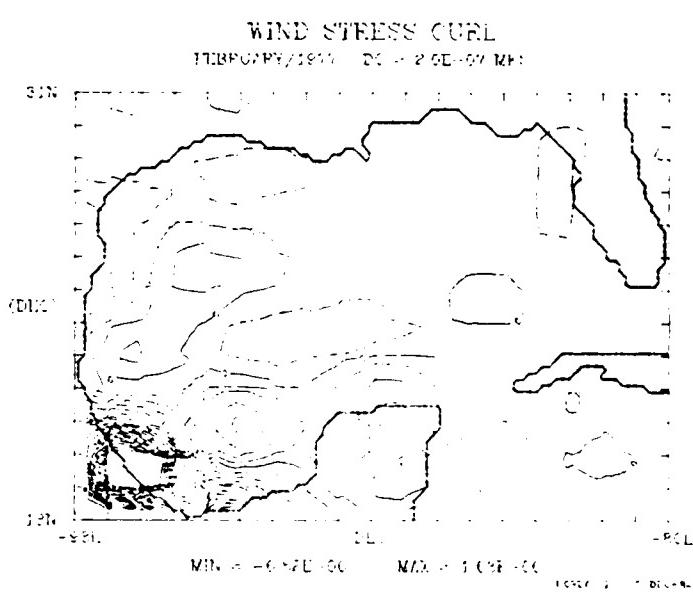
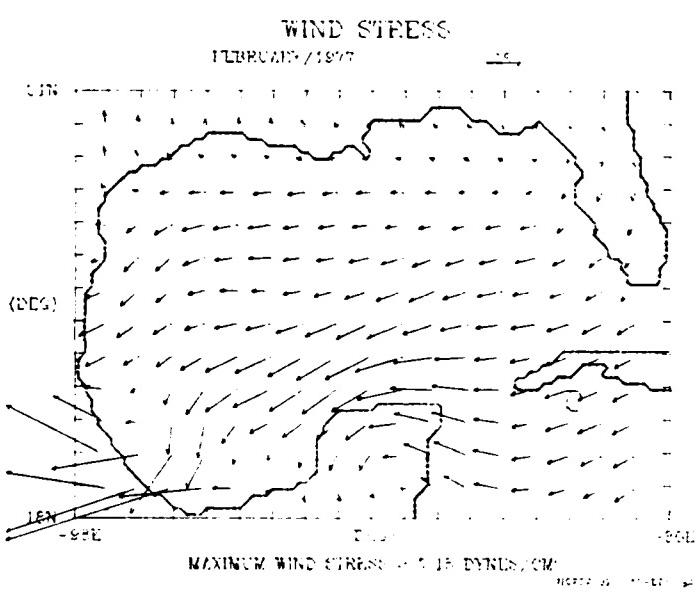
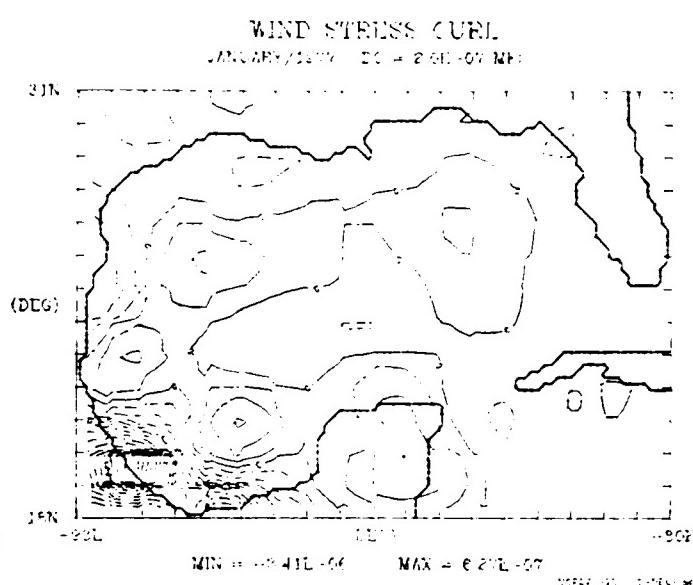
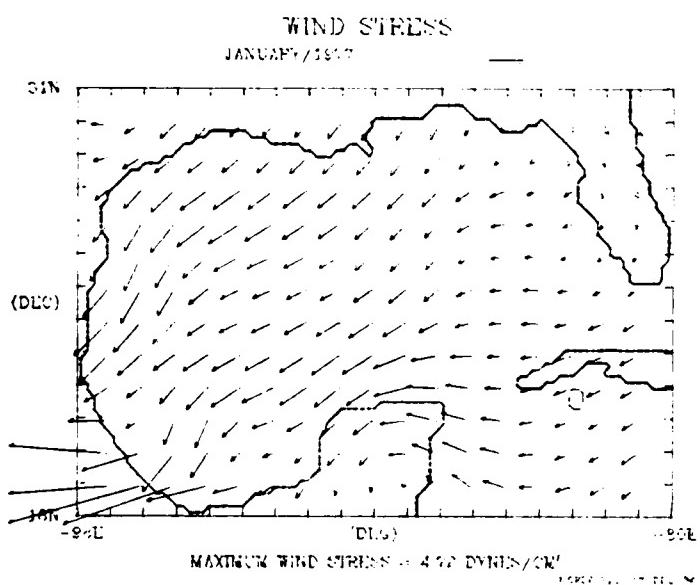


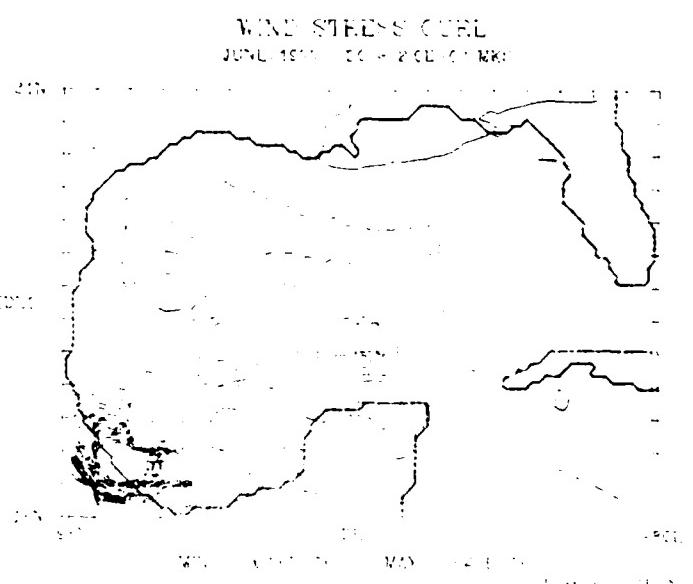
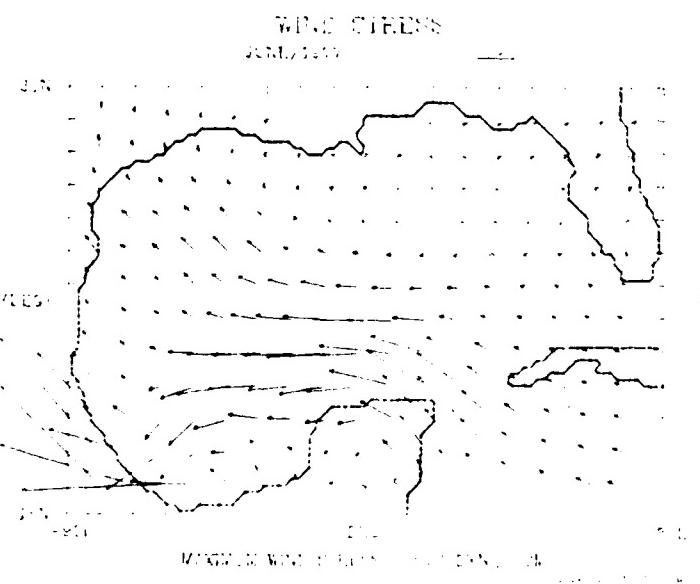
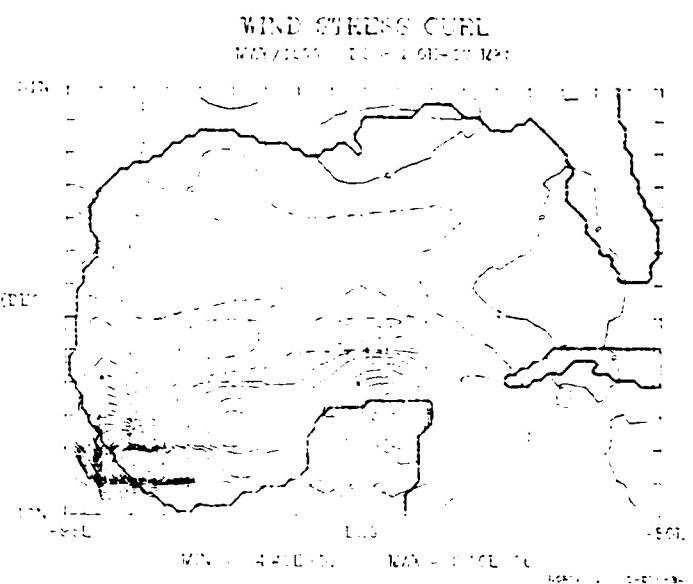
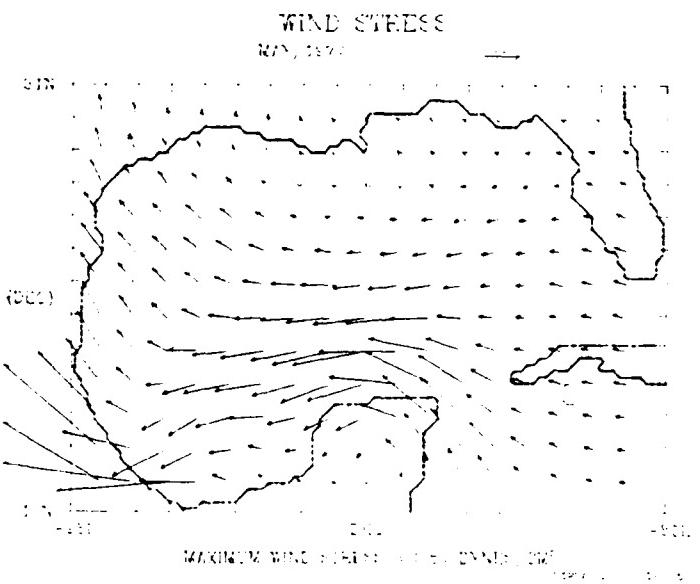
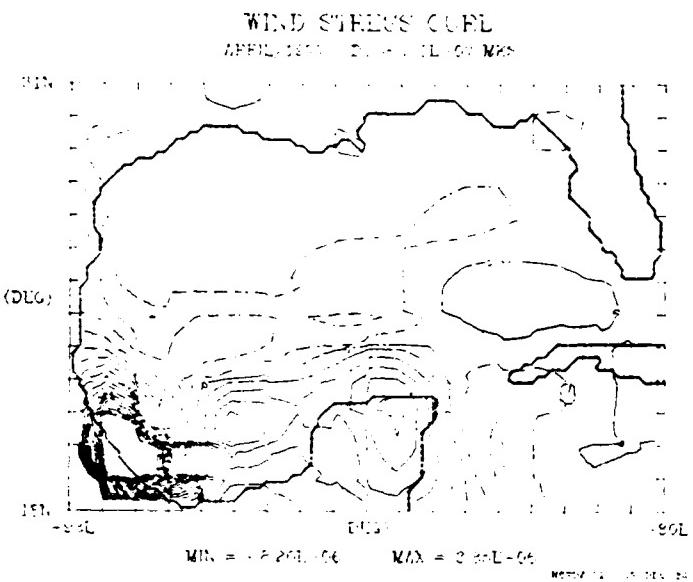
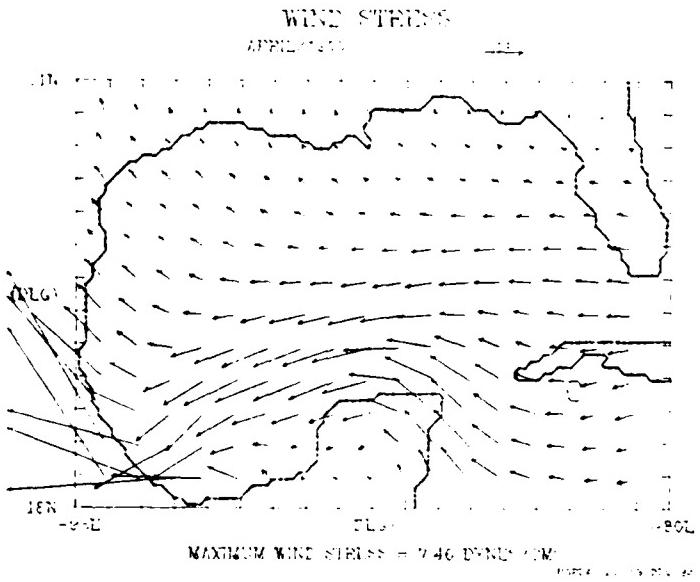


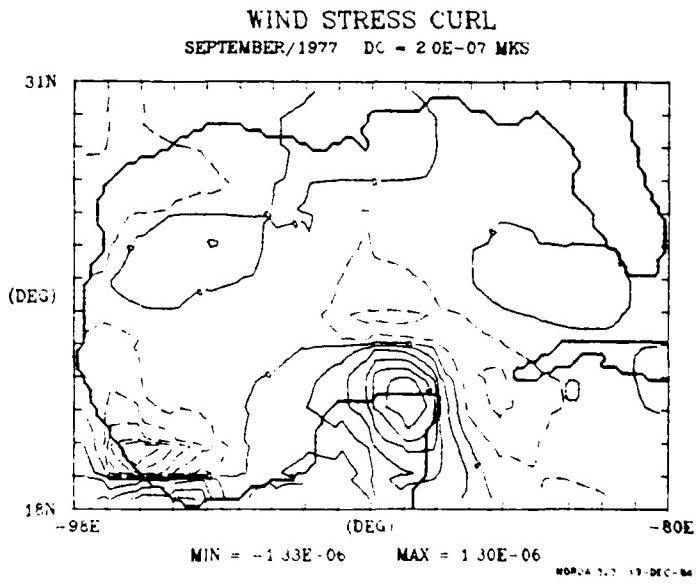
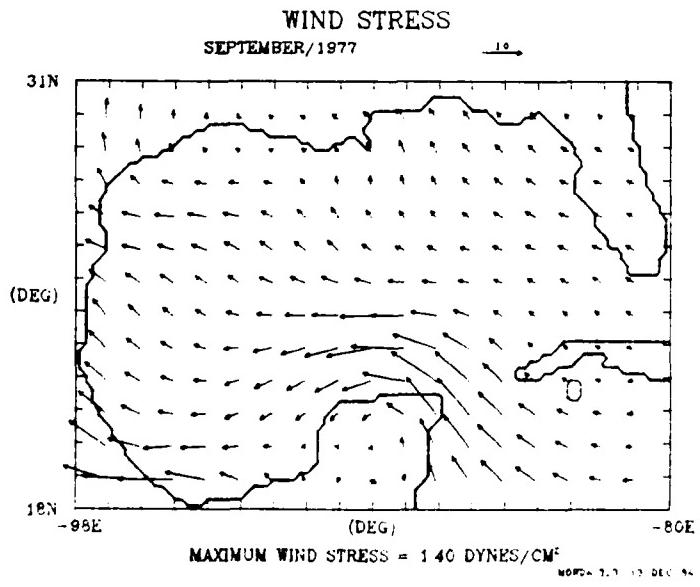
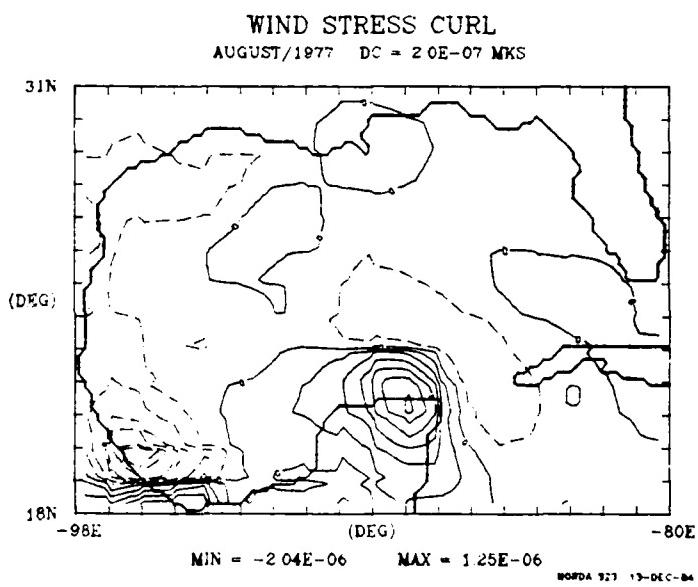
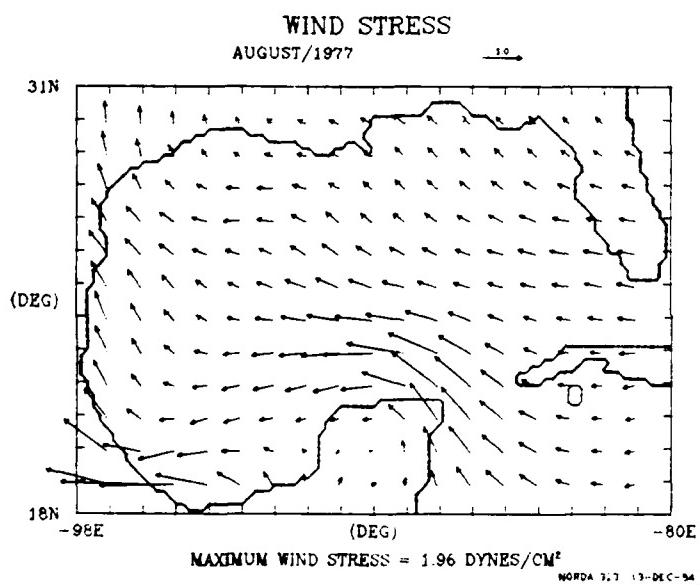
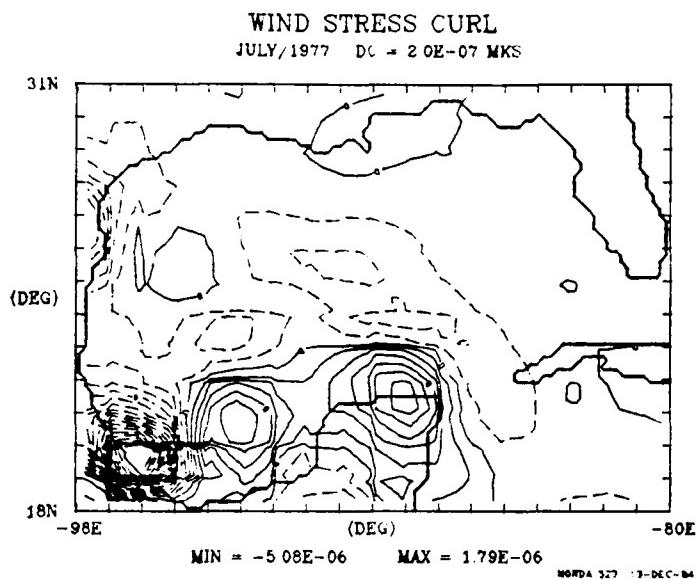
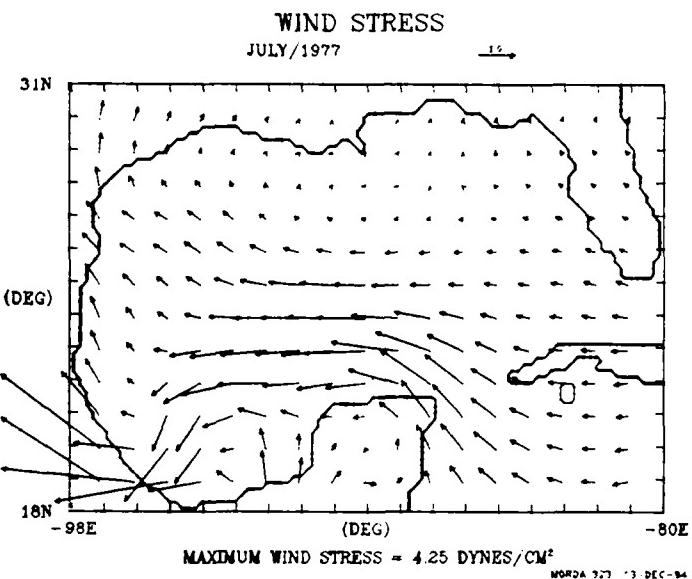


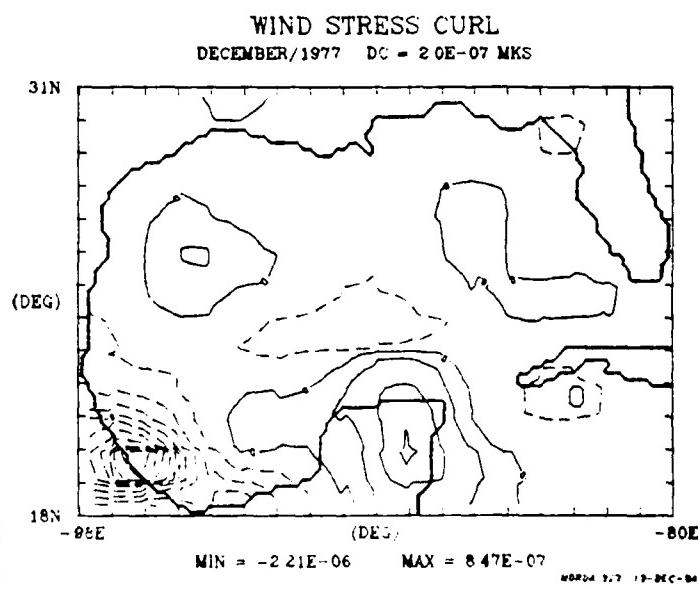
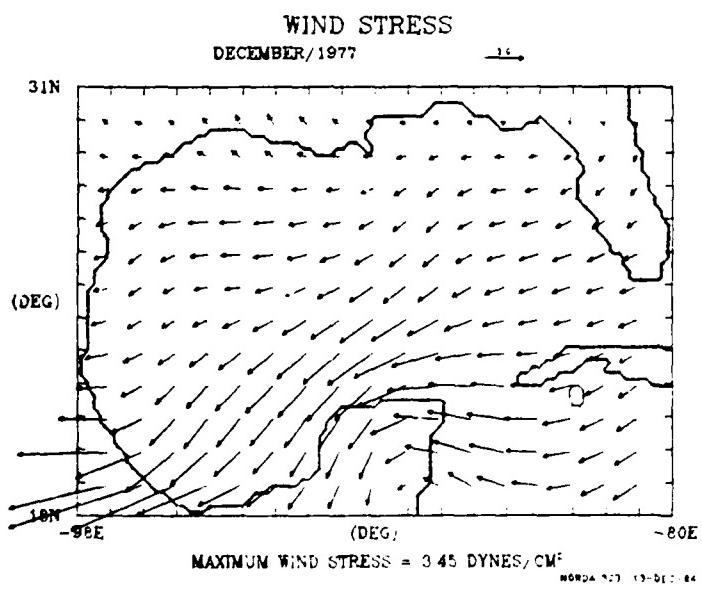
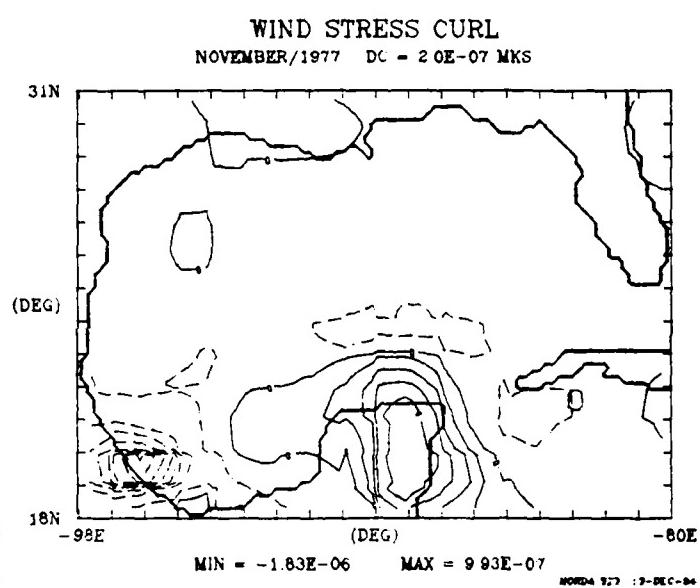
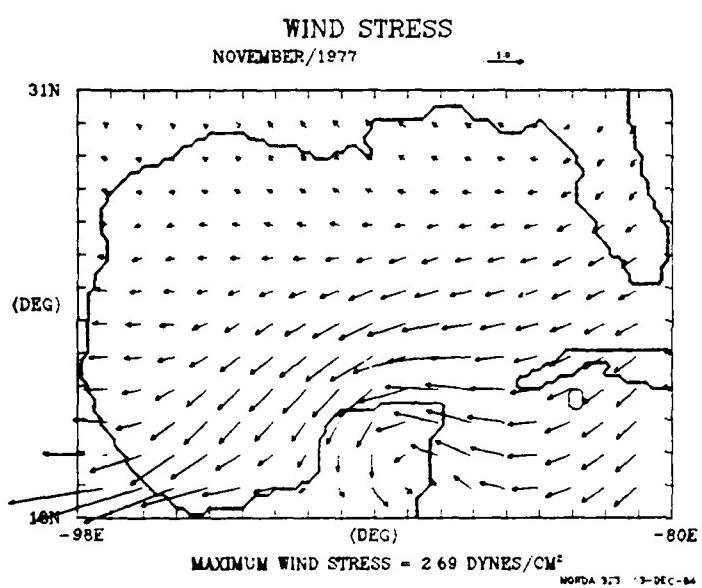
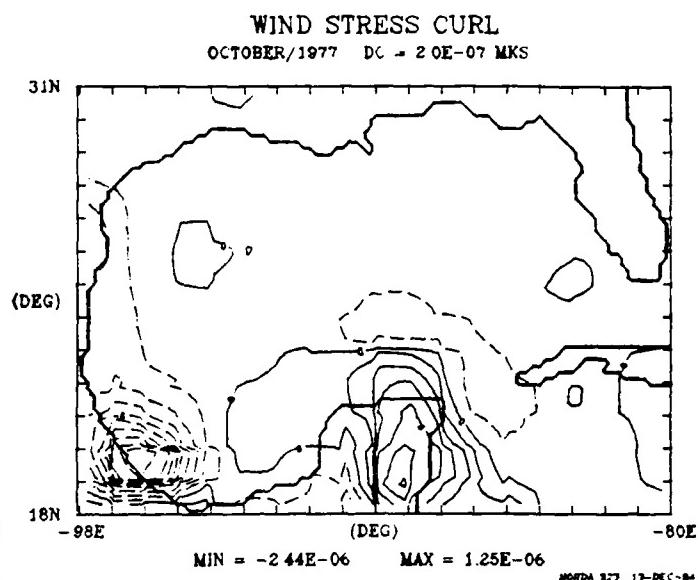
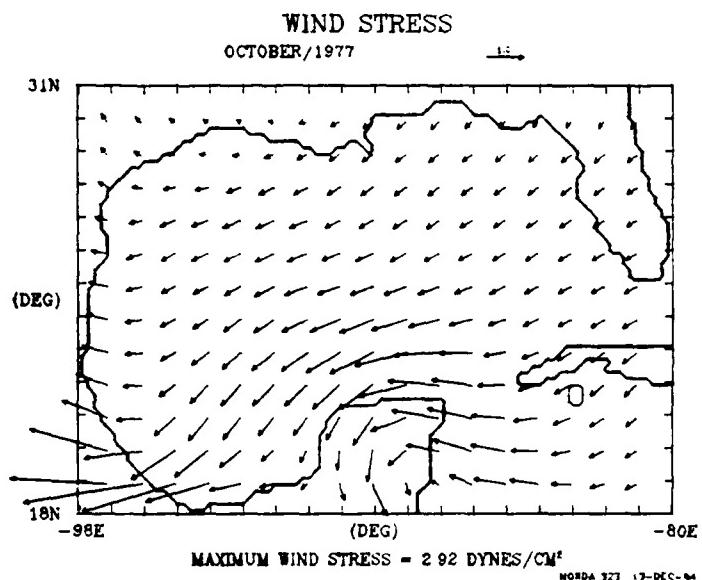


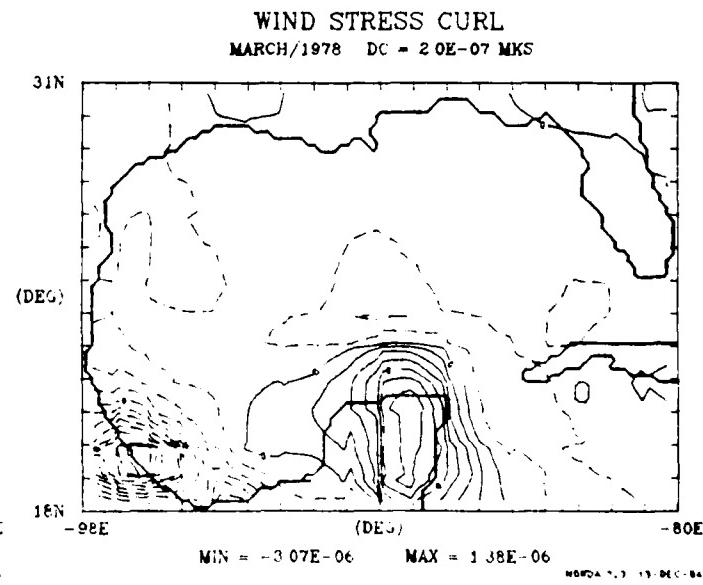
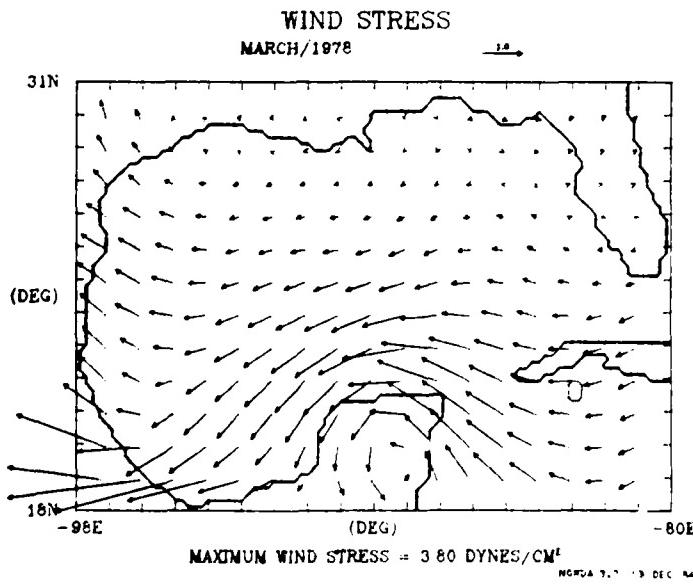
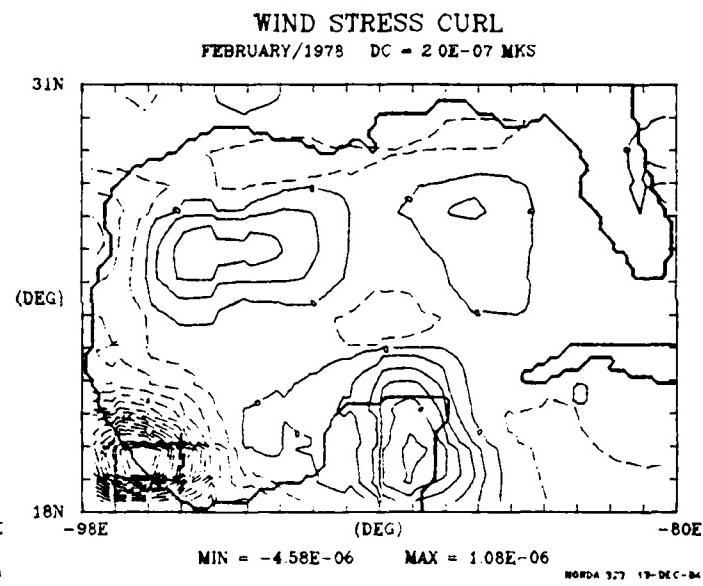
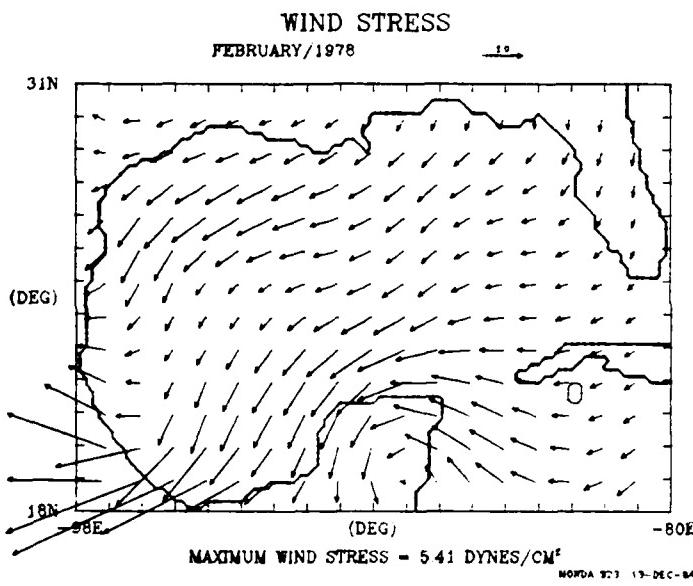
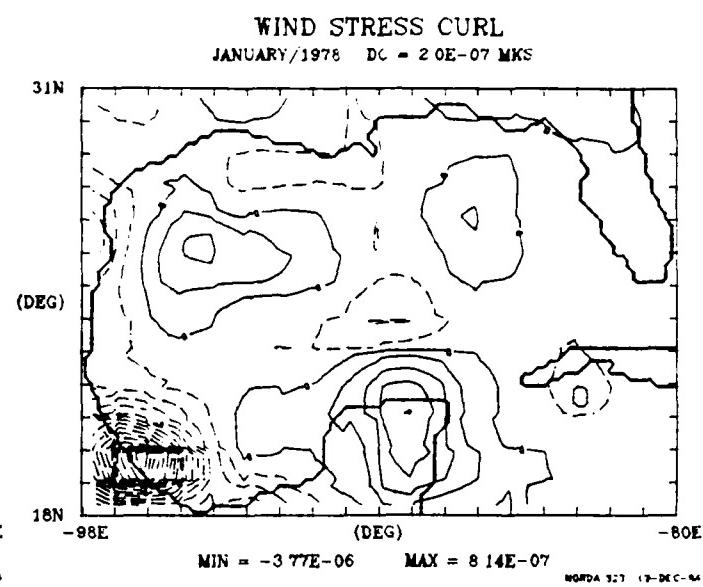
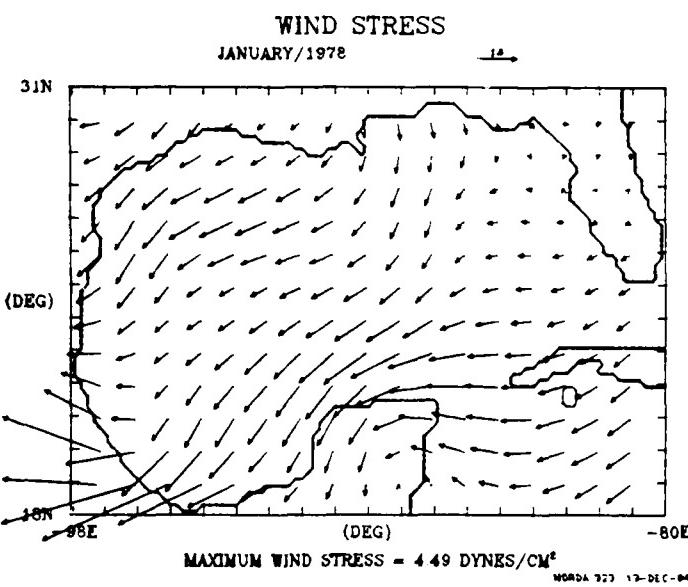


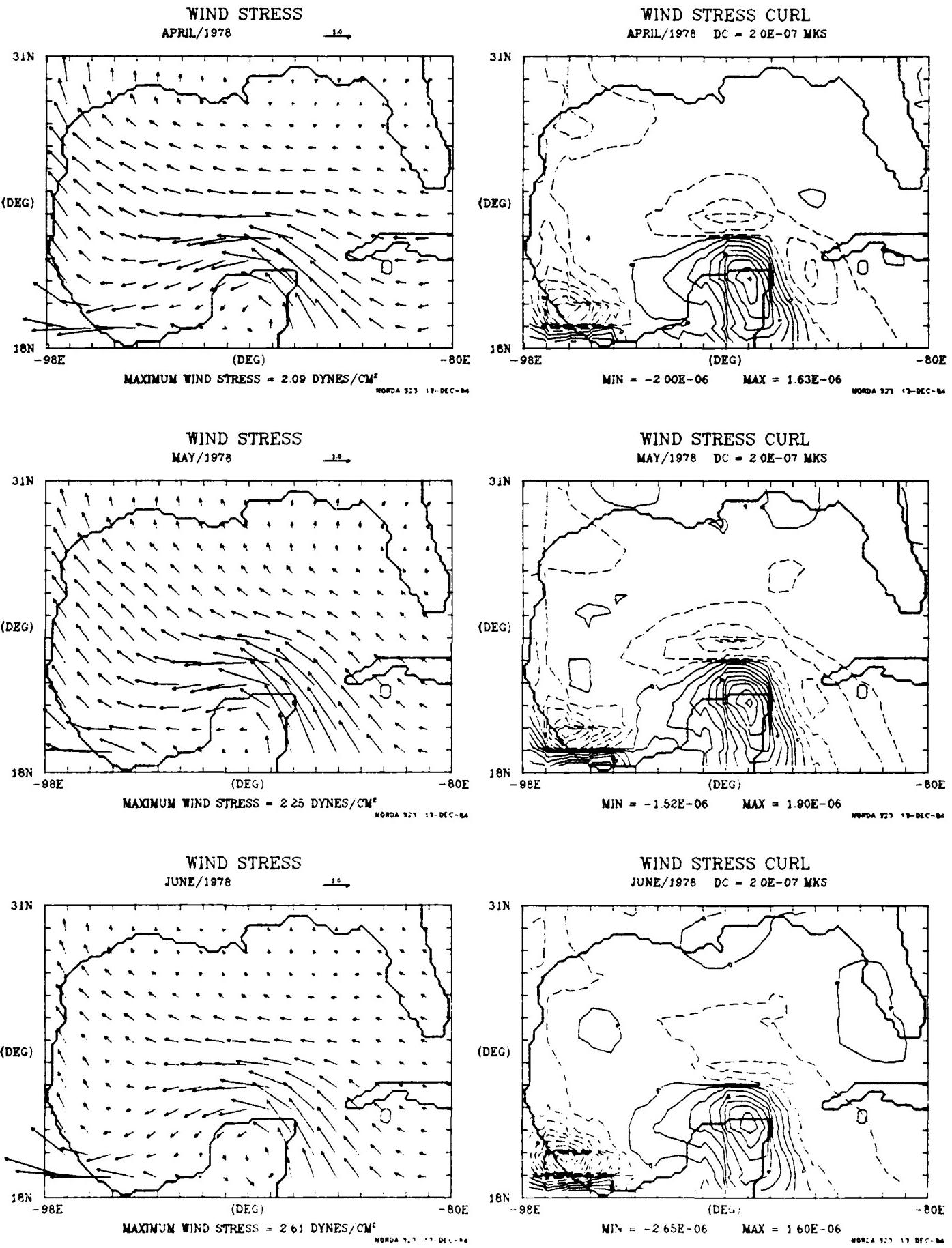


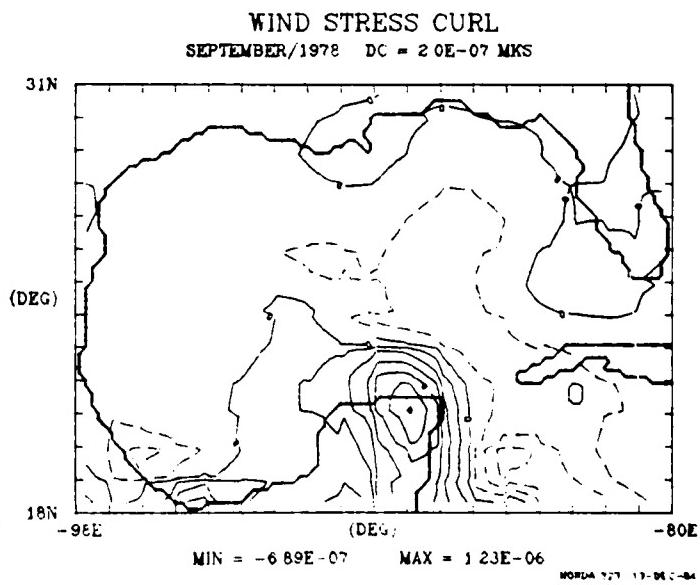
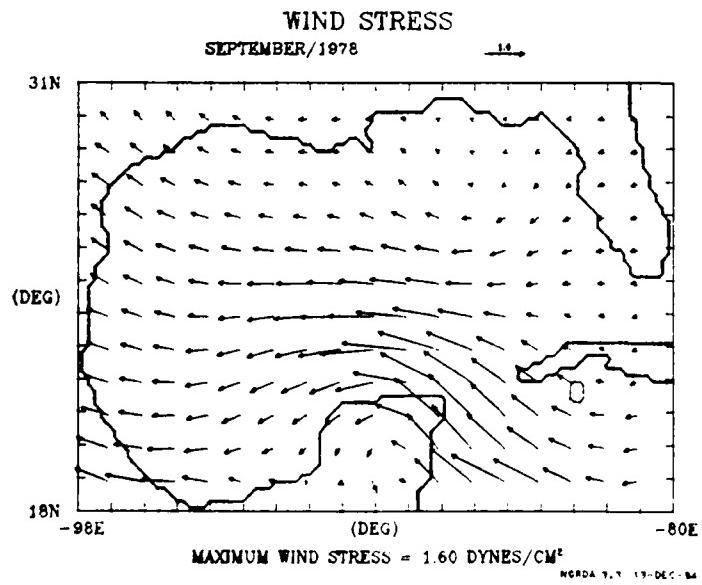
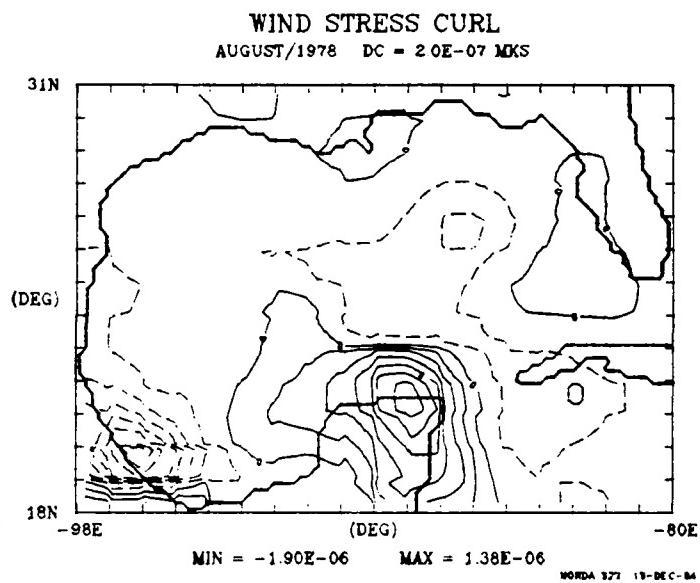
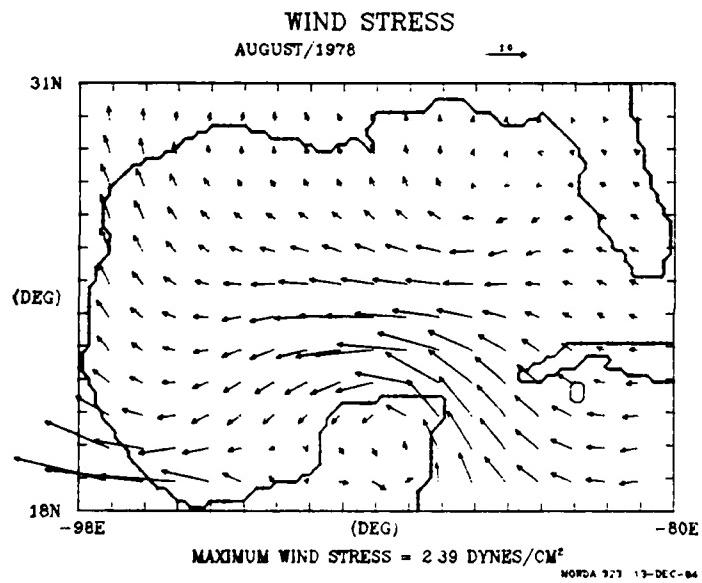
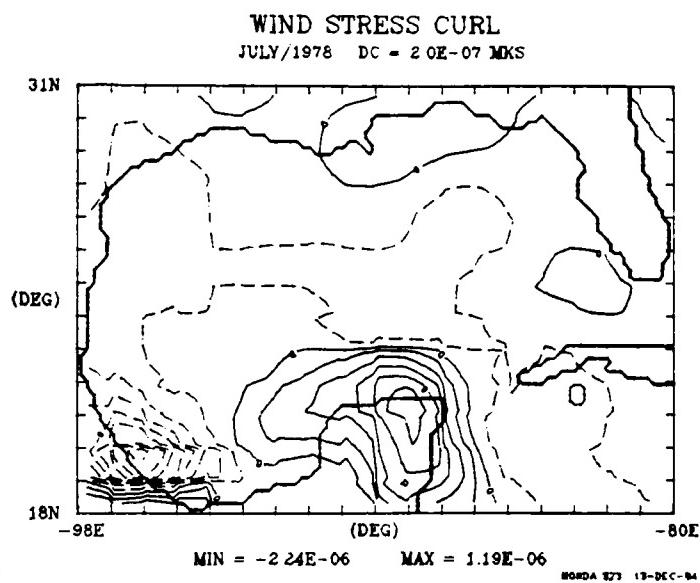
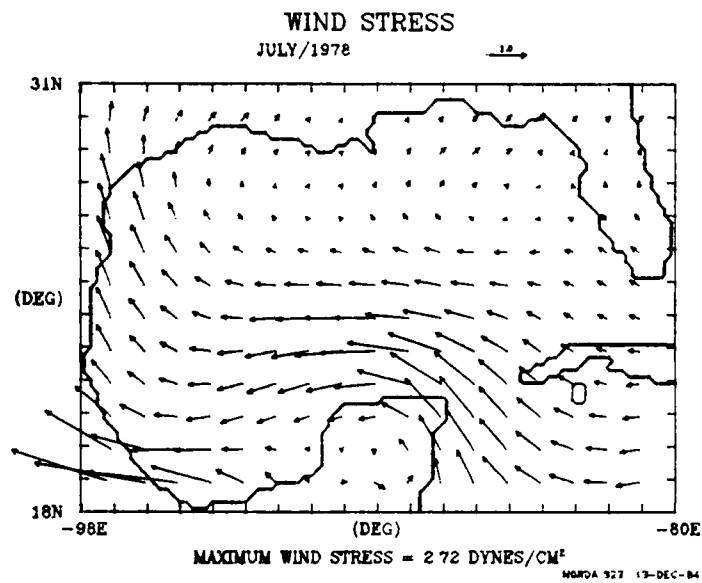


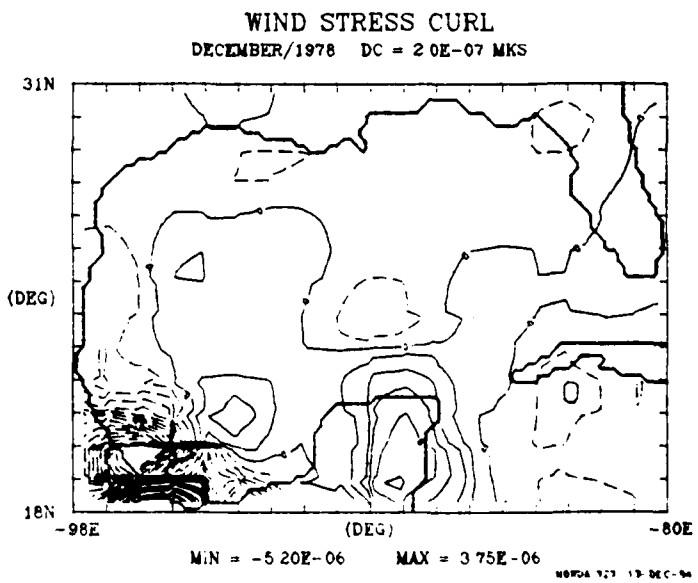
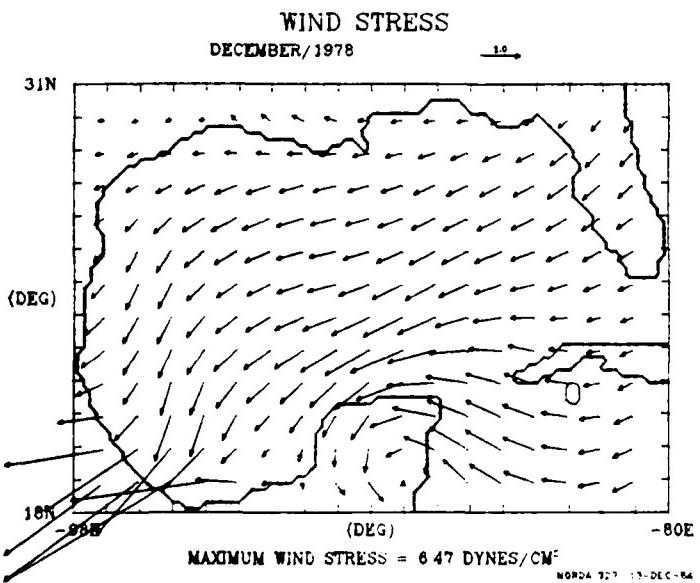
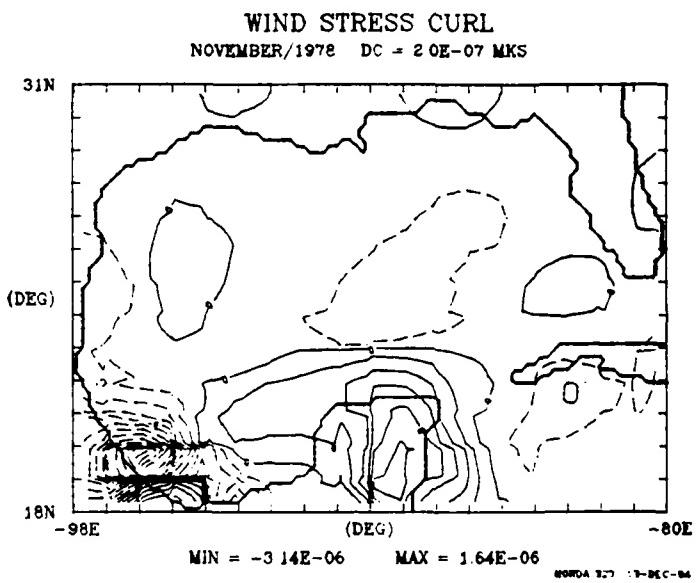
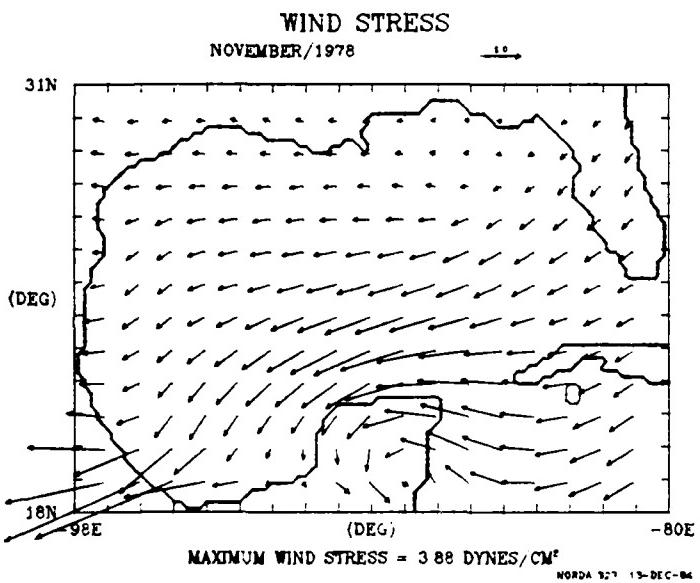
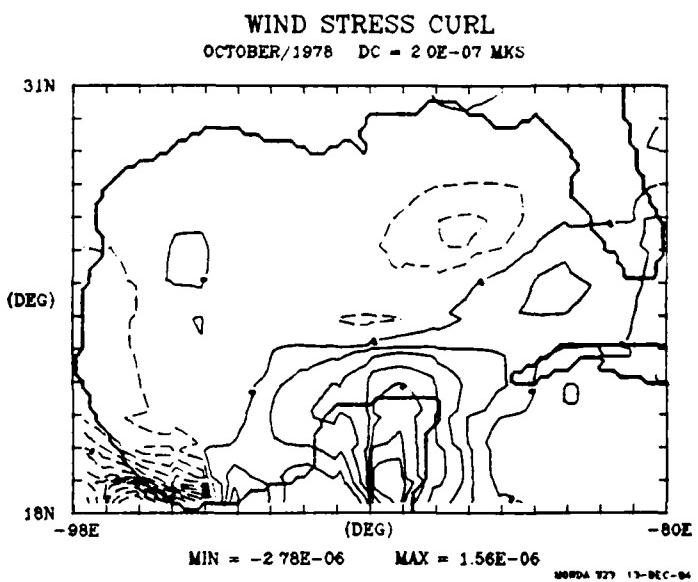
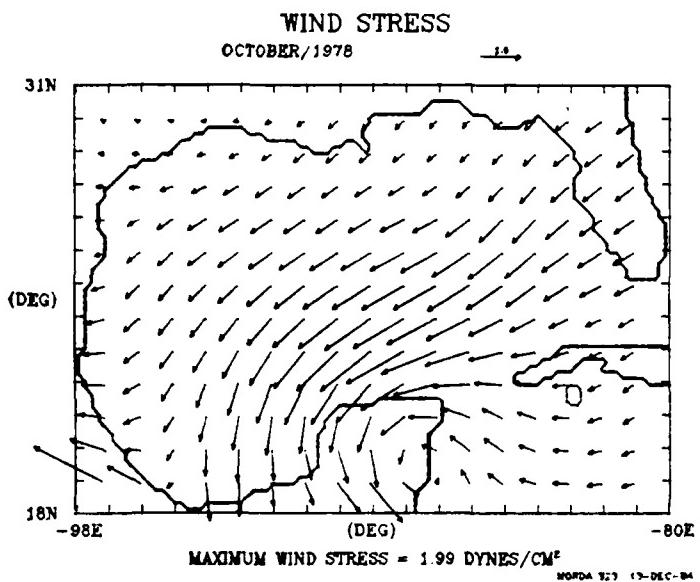


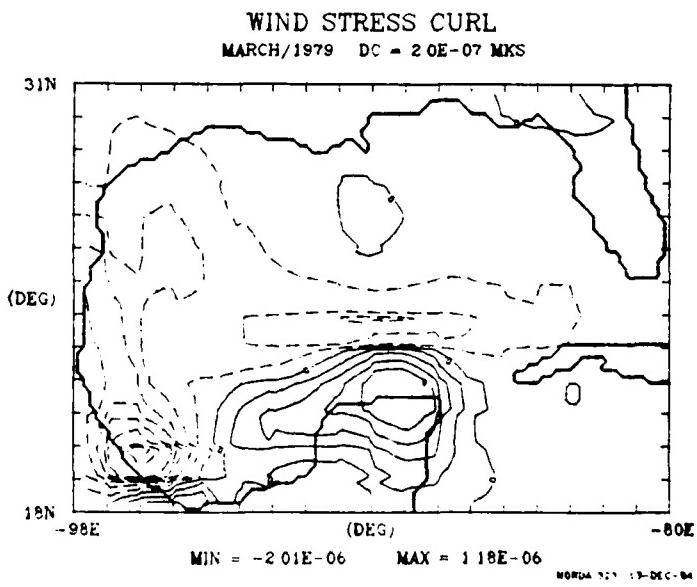
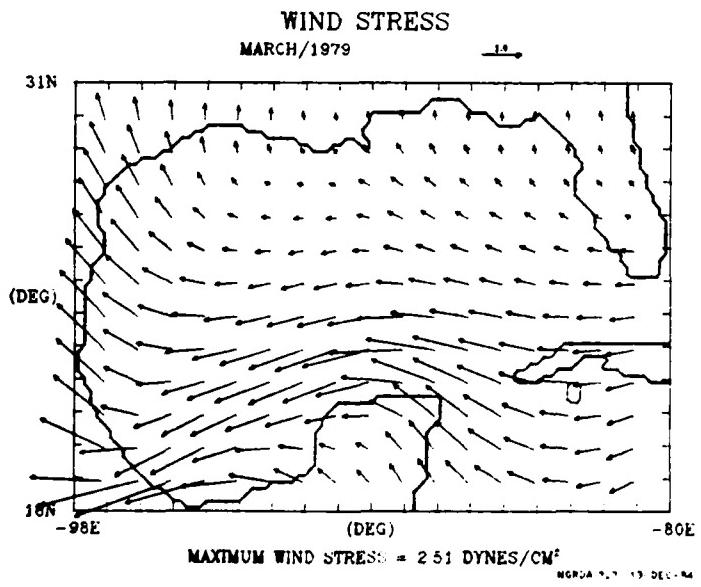
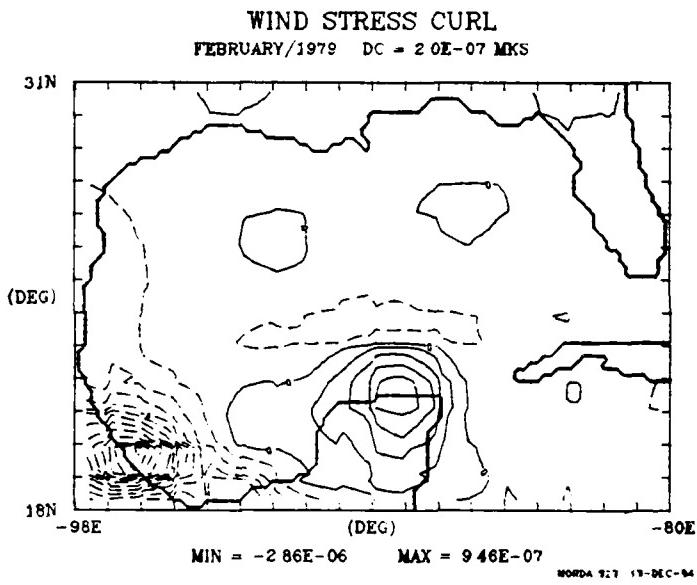
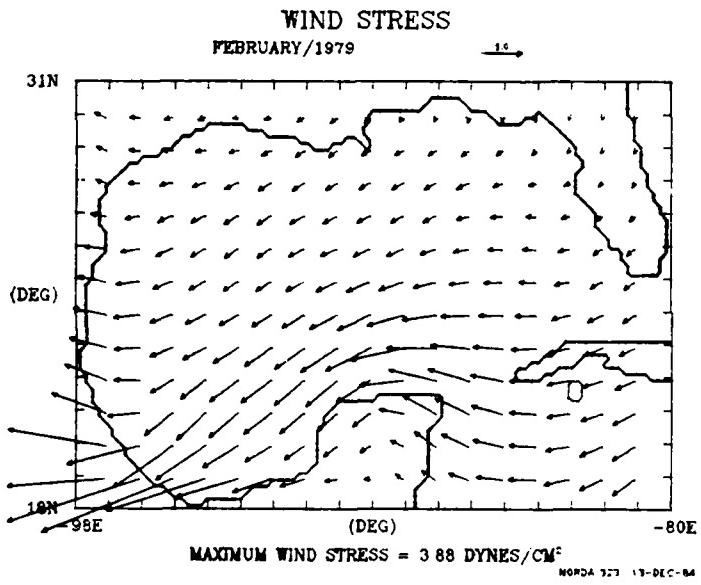
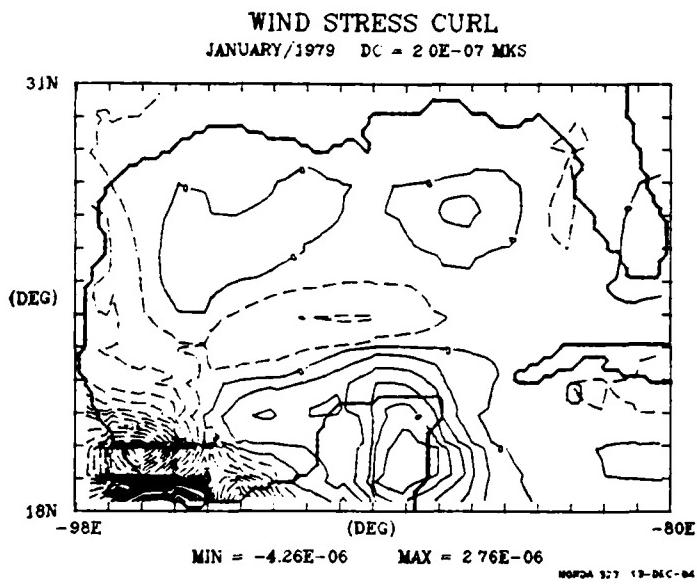
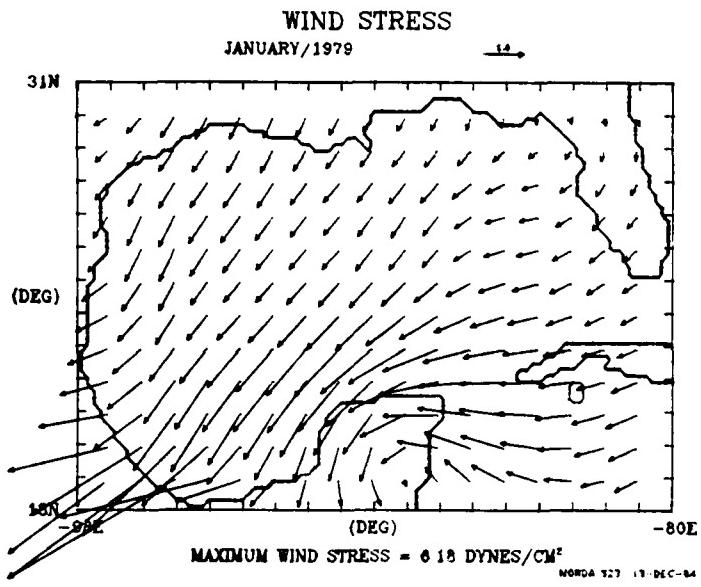


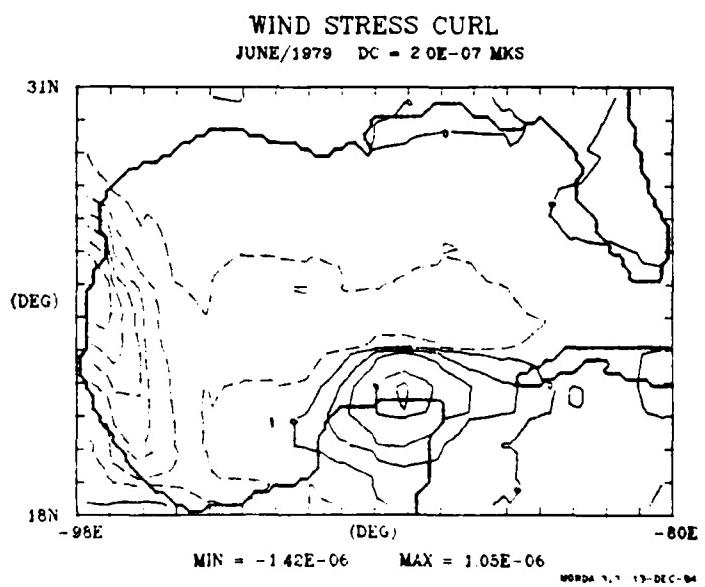
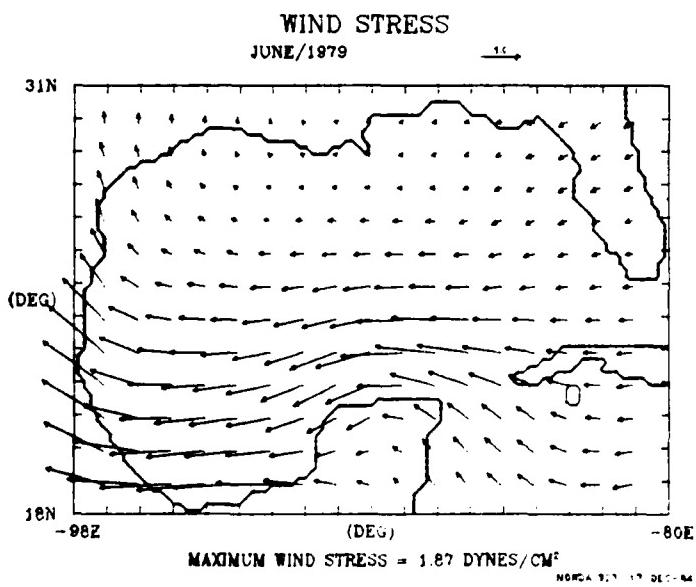
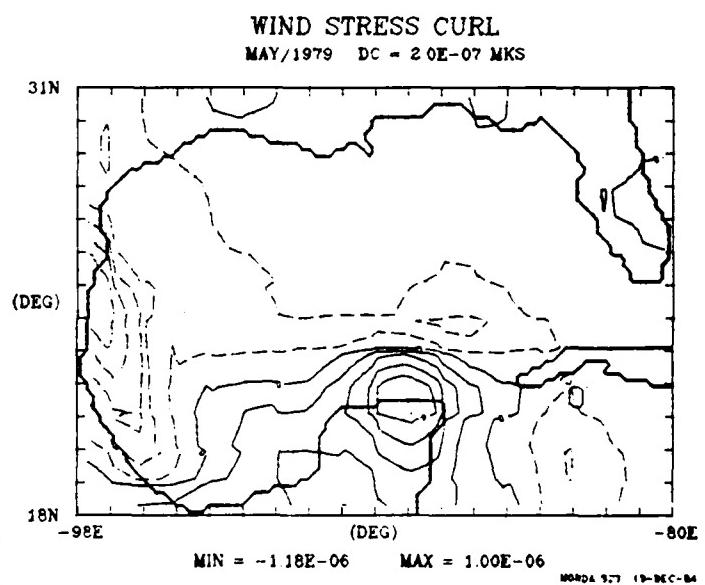
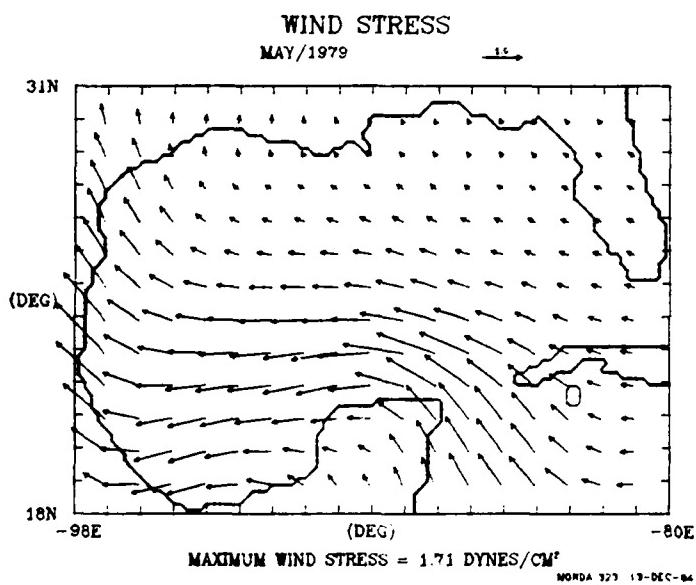
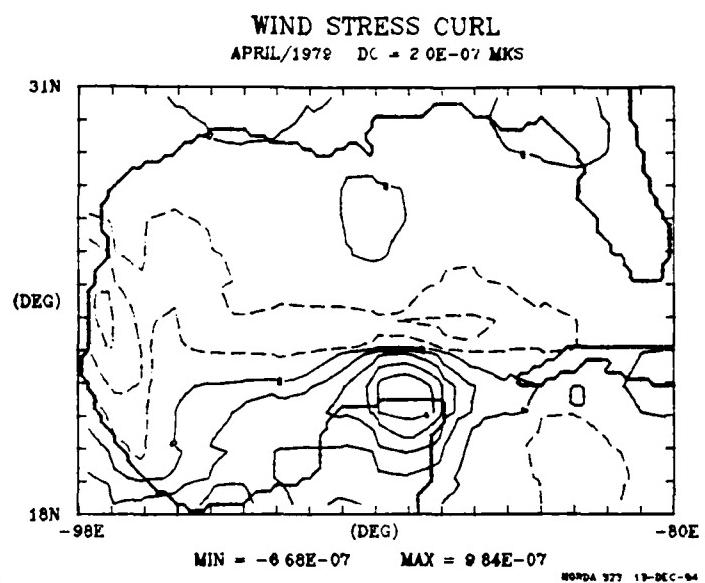
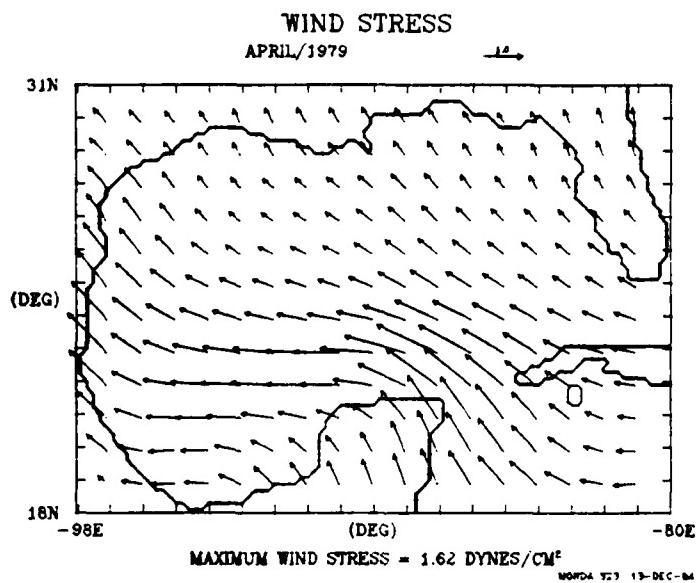


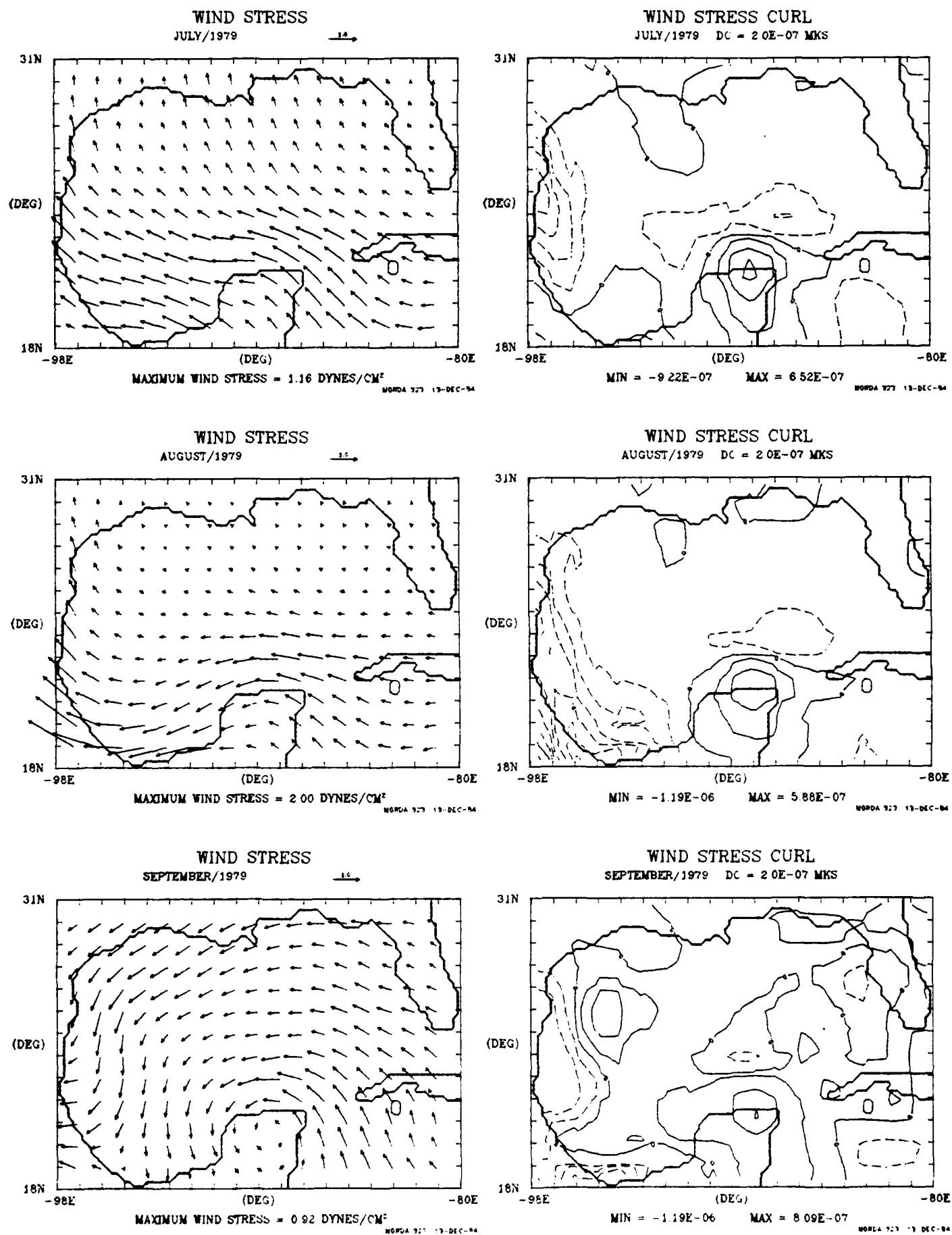


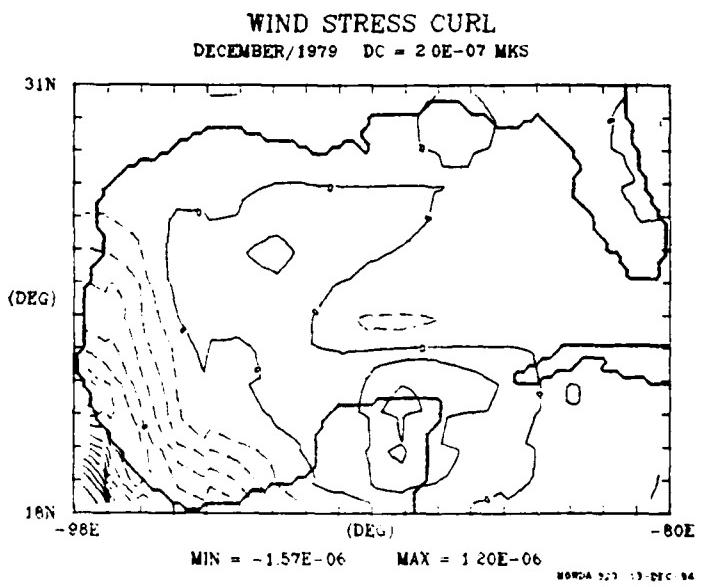
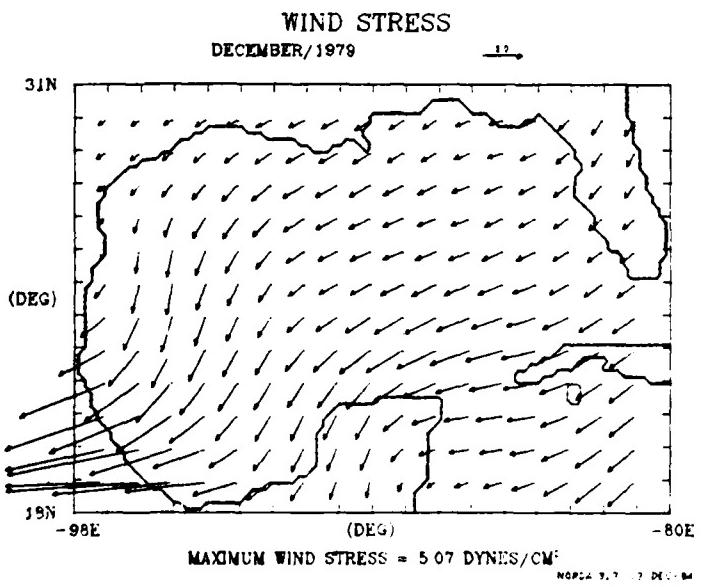
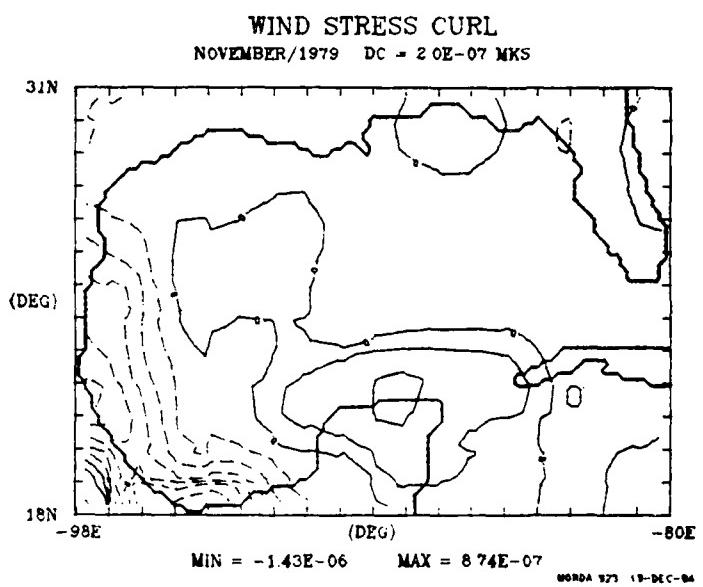
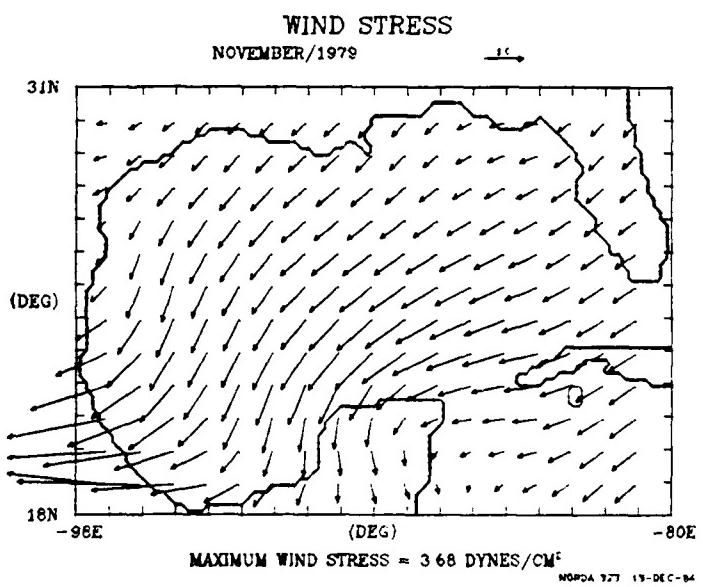
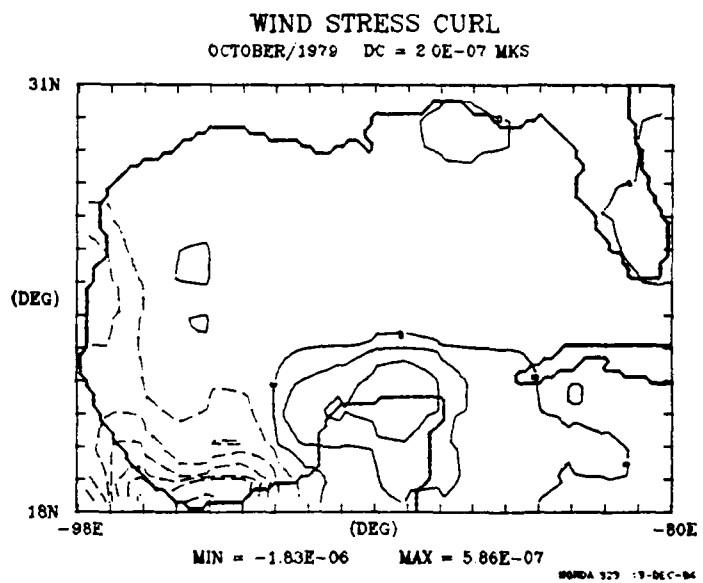
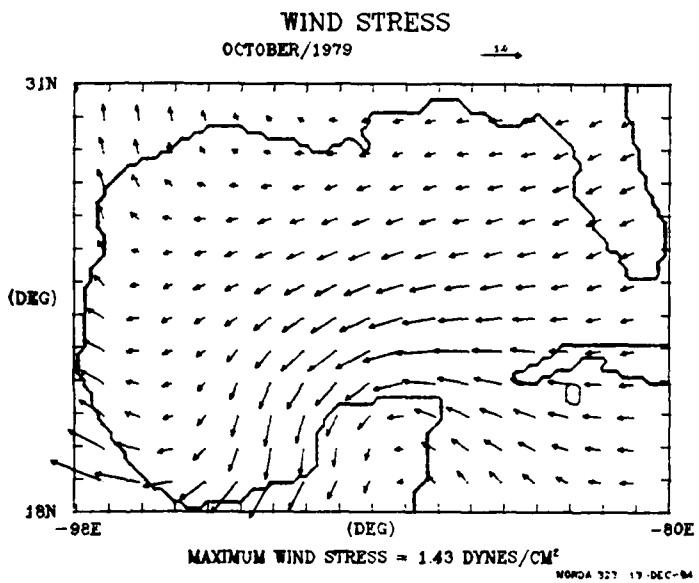


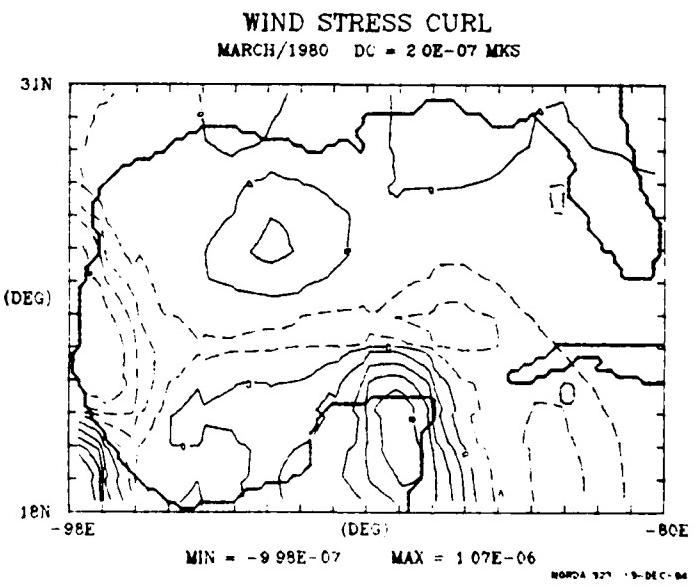
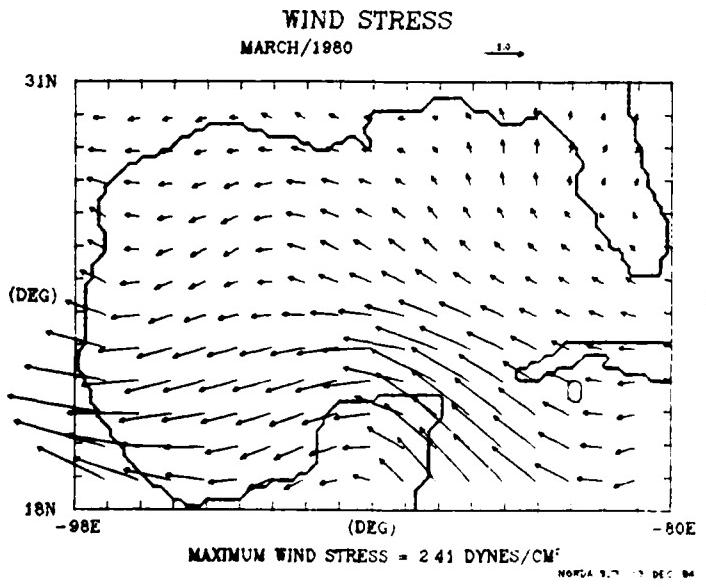
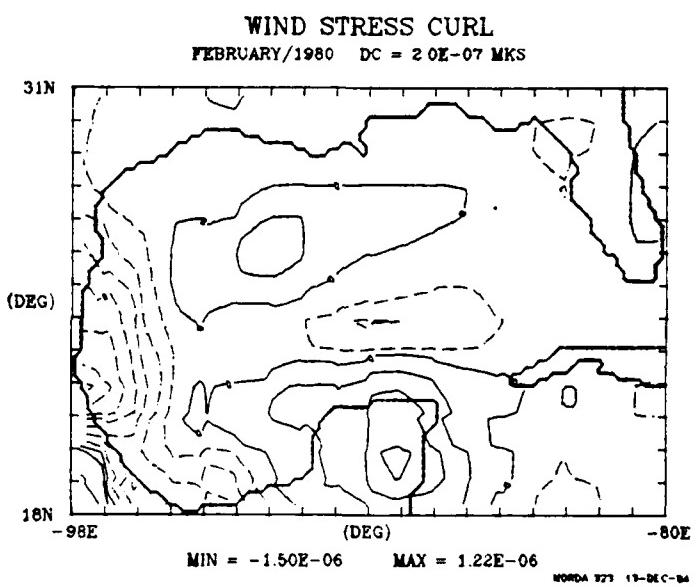
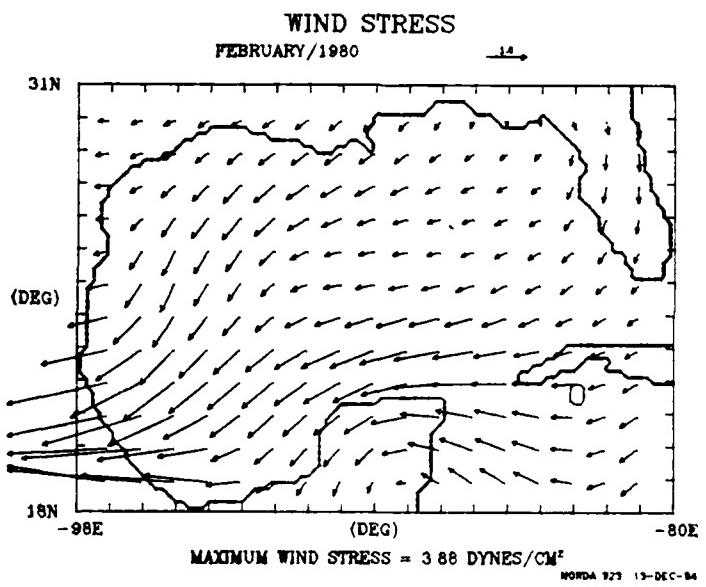
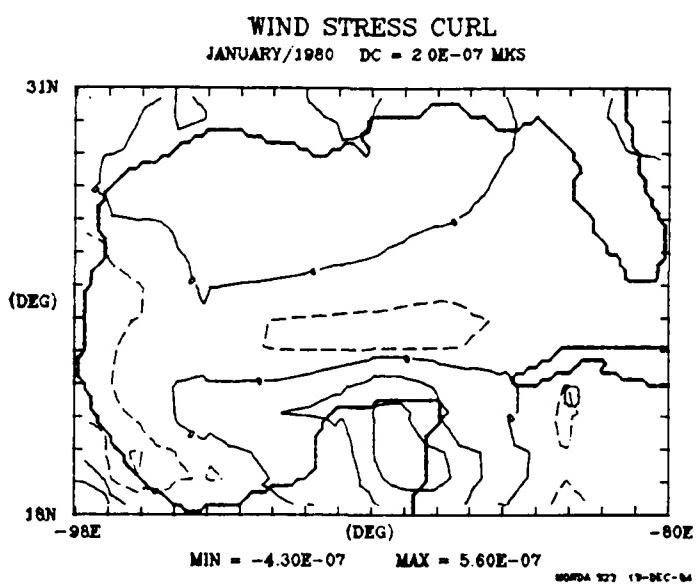
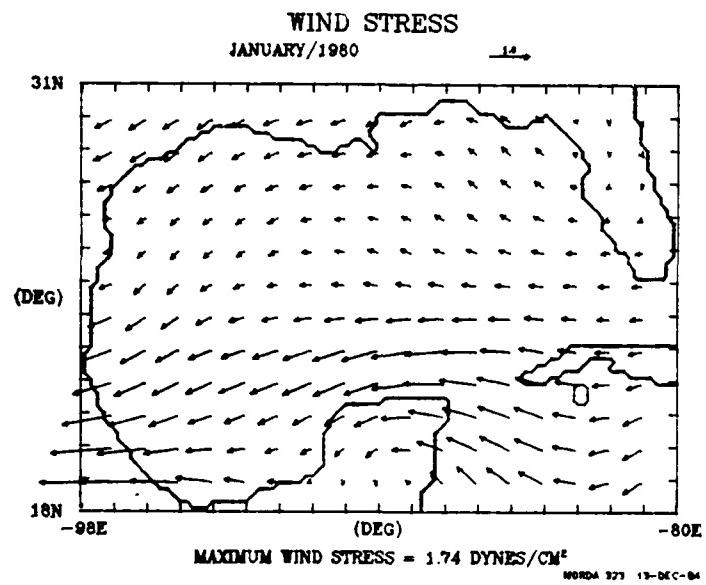




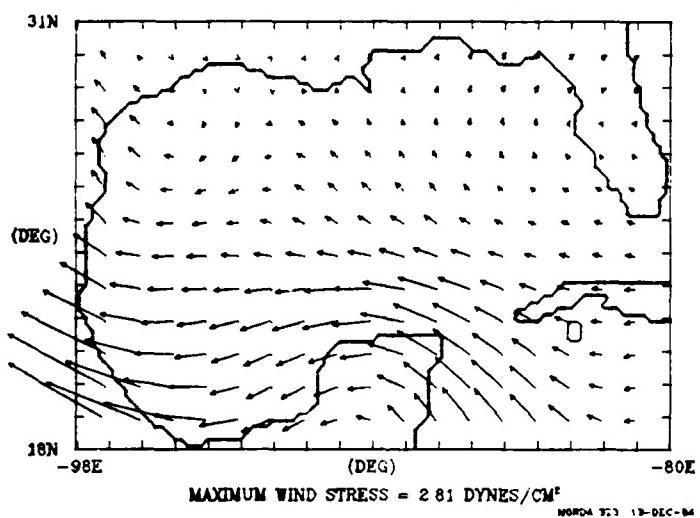




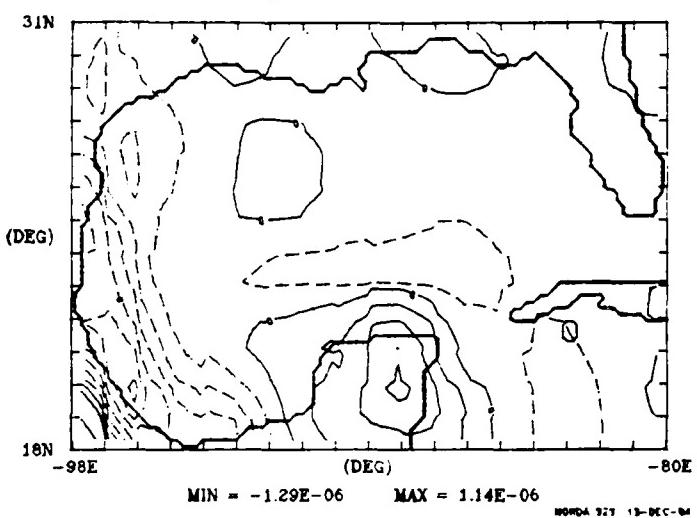




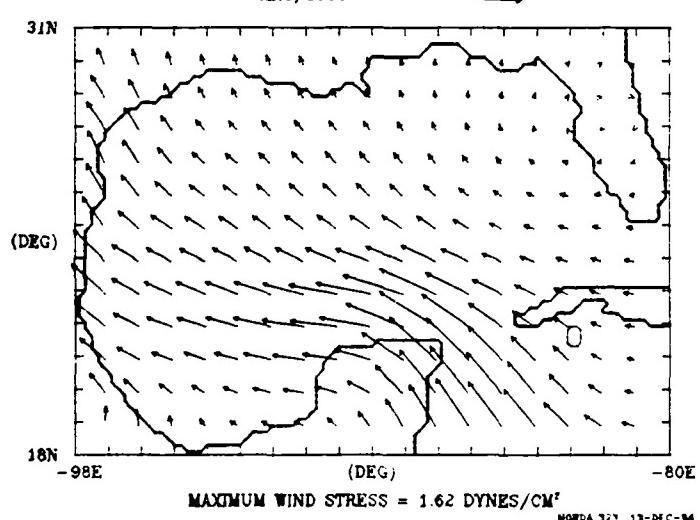
WIND STRESS
APRIL/1980



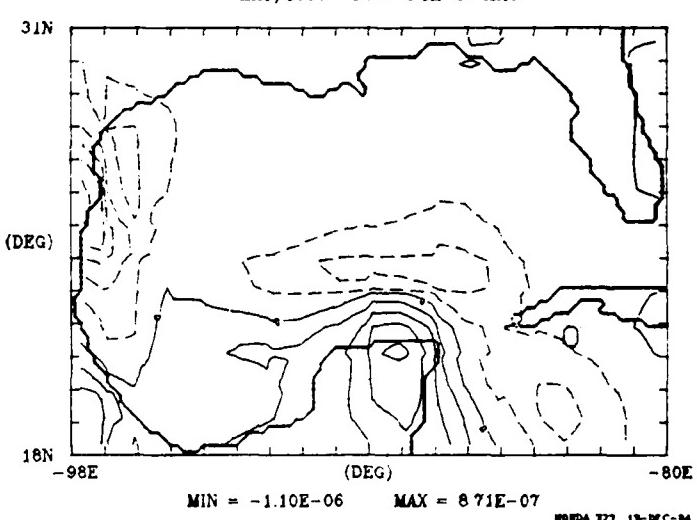
WIND STRESS CURL
APRIL/1980 DC = 2.0E-07 MKS



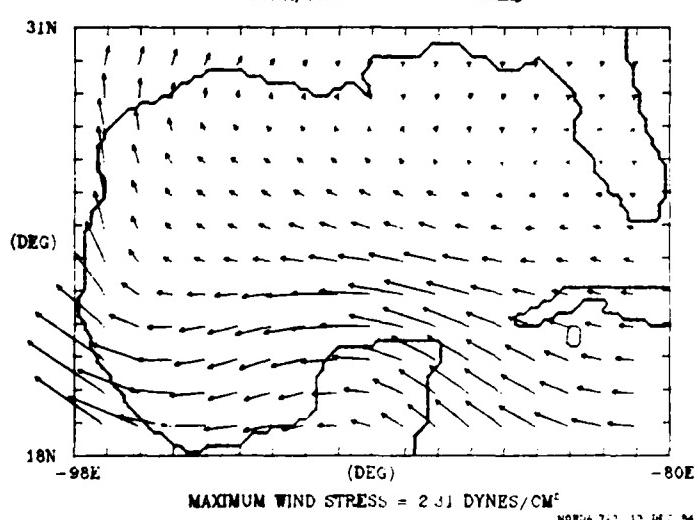
WIND STRESS
MAY/1980



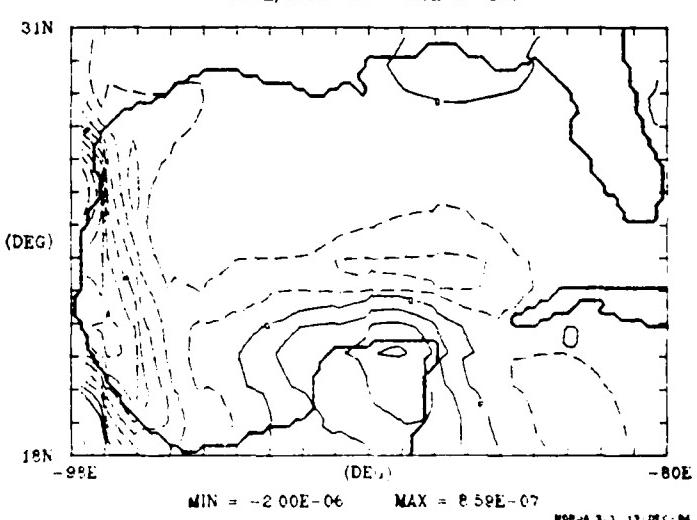
WIND STRESS CURL
MAY/1980 DC = 2.0E-07 MKS



WIND STRESS
JUNE/1980

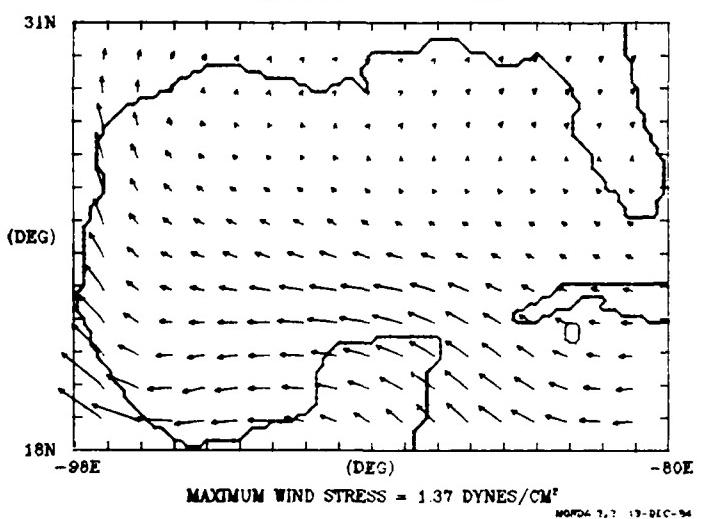


WIND STRESS CURL
JUNE/1980 DC = 2.0E-07 MKS

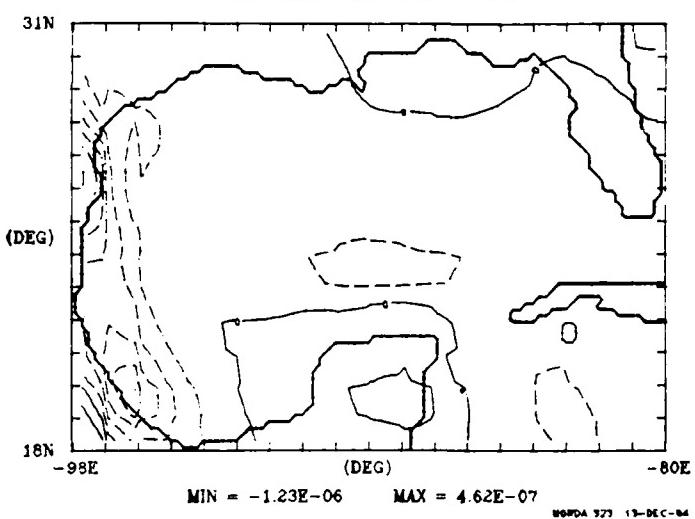


WIND STRESS
JULY/1980

$\frac{1}{16}$

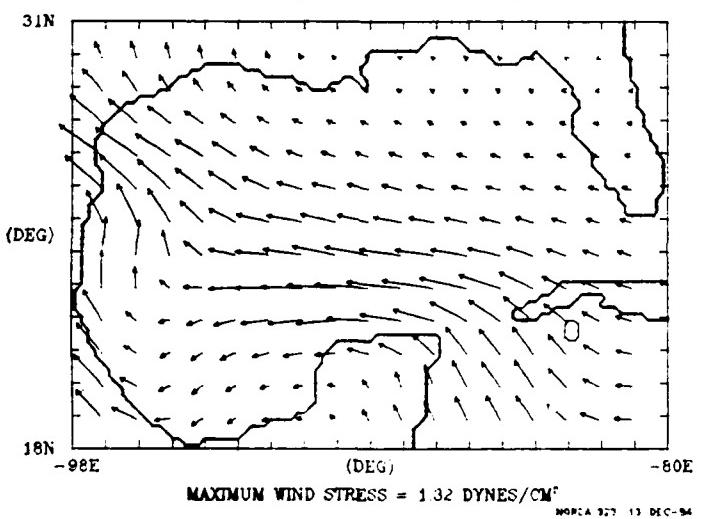


WIND STRESS CURL
JULY/1980 DC = 2.0E-07 MKS

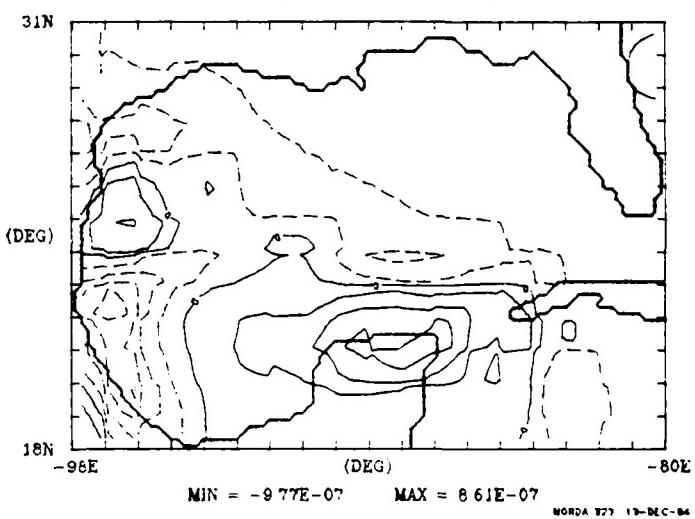


WIND STRESS
AUGUST/1980

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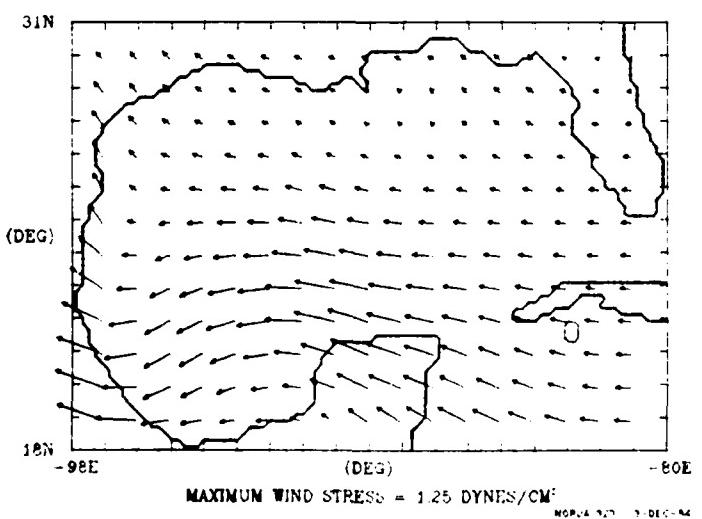


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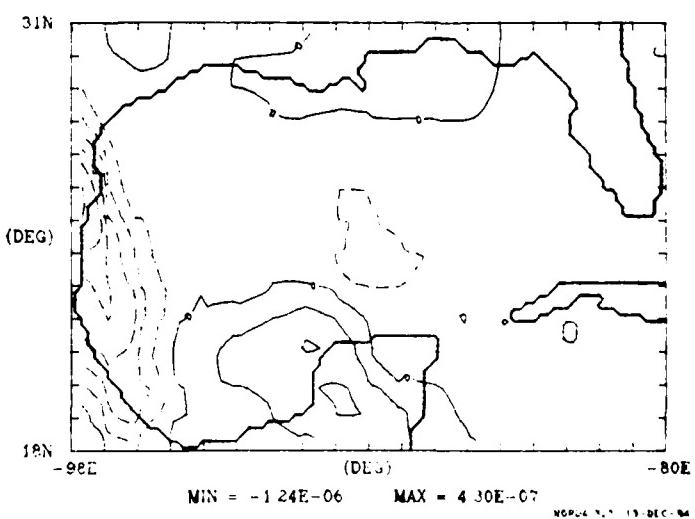


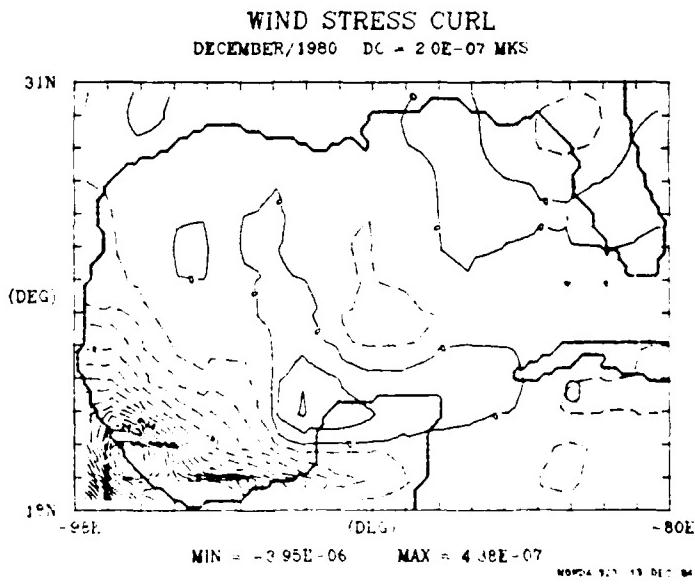
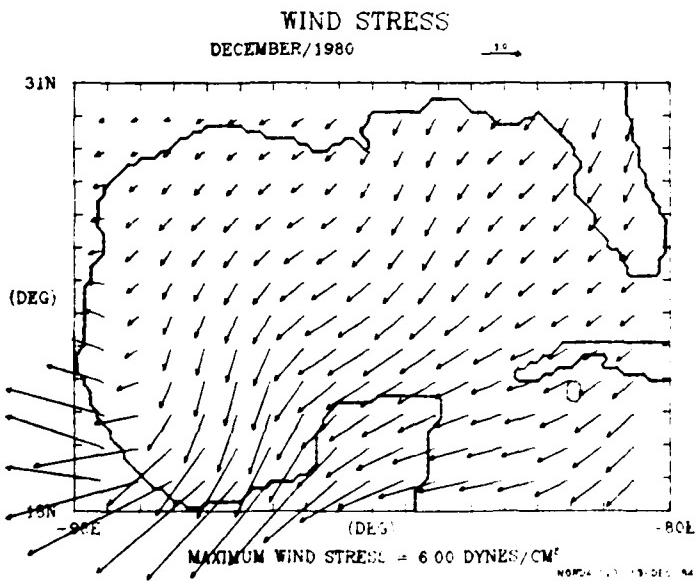
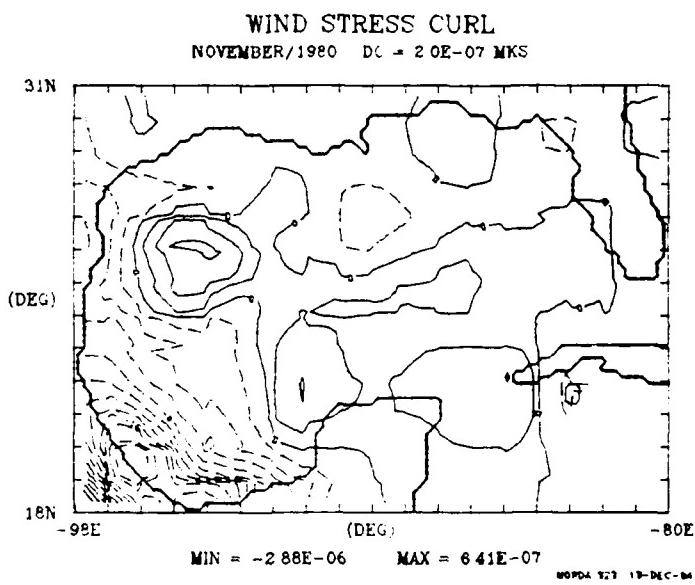
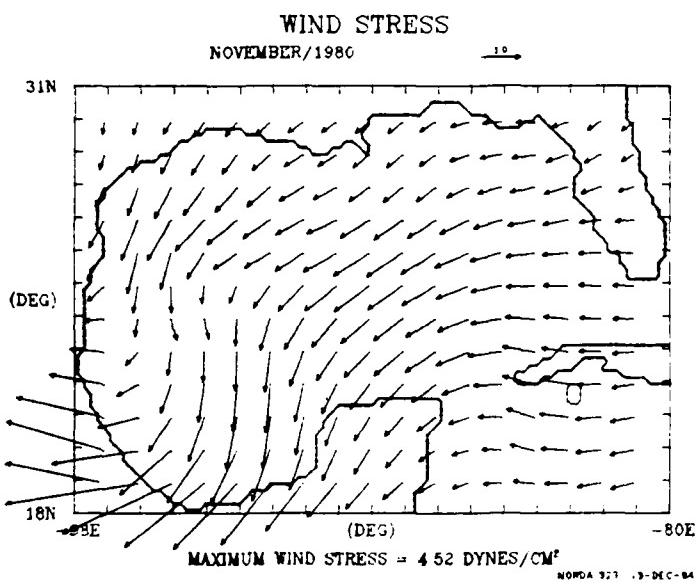
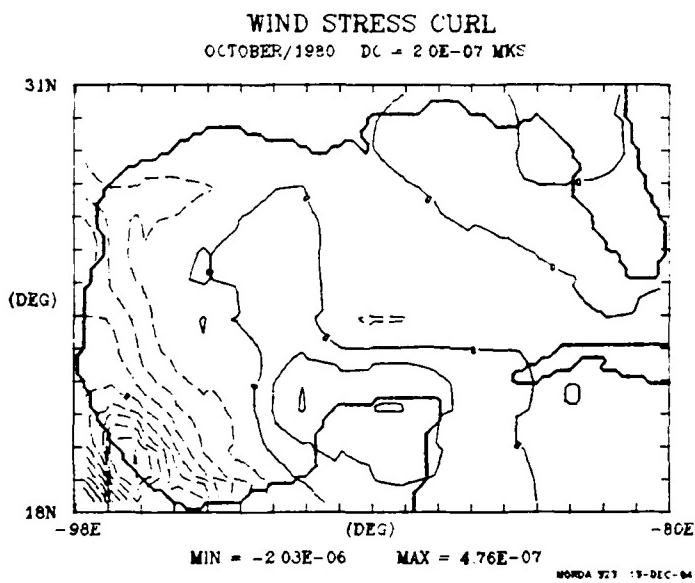
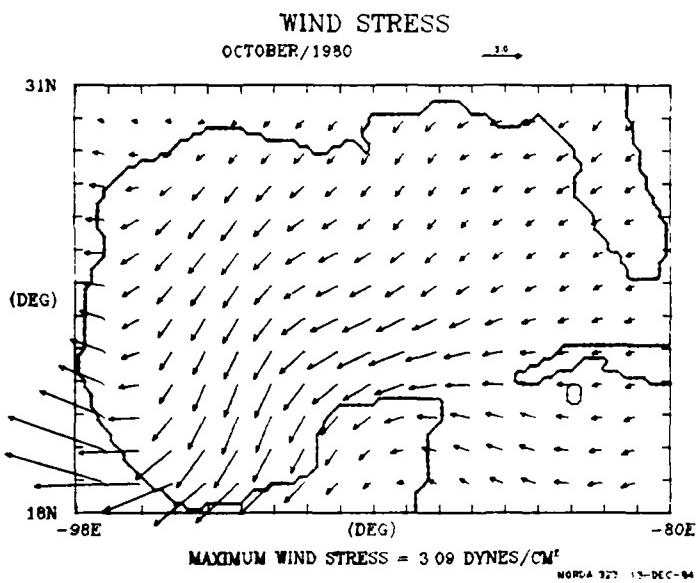
WIND STRESS
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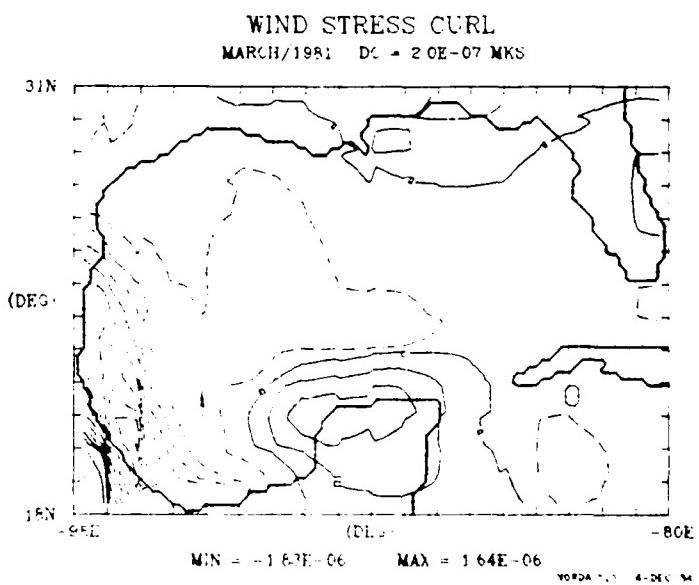
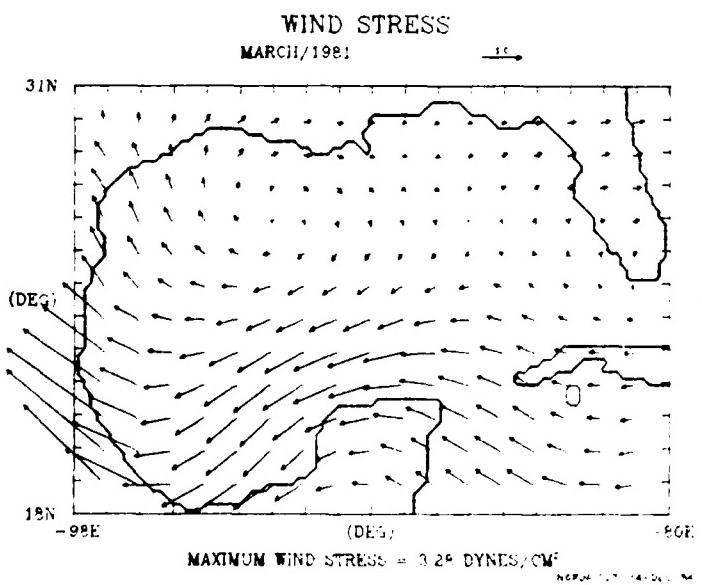
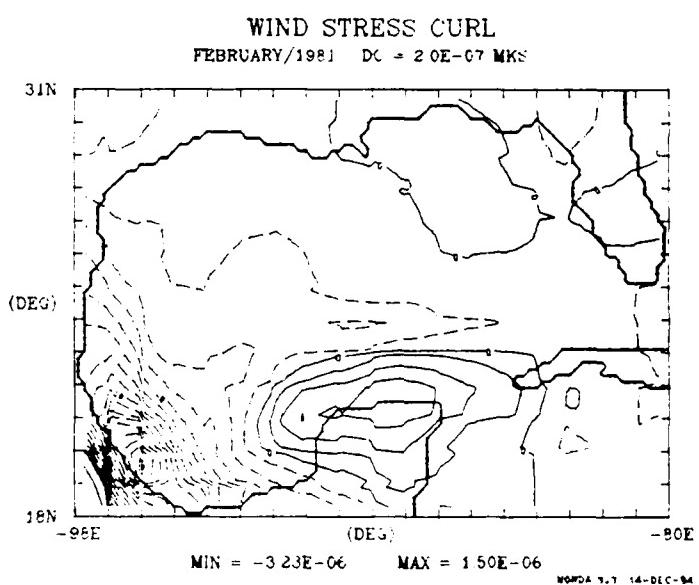
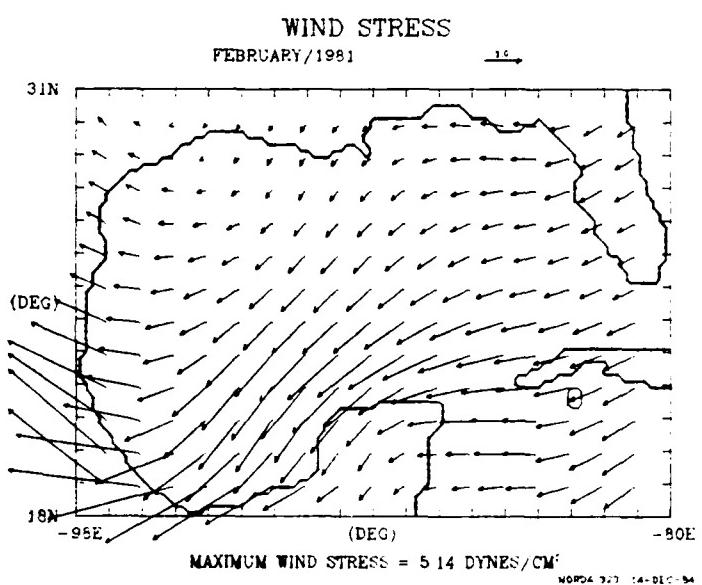
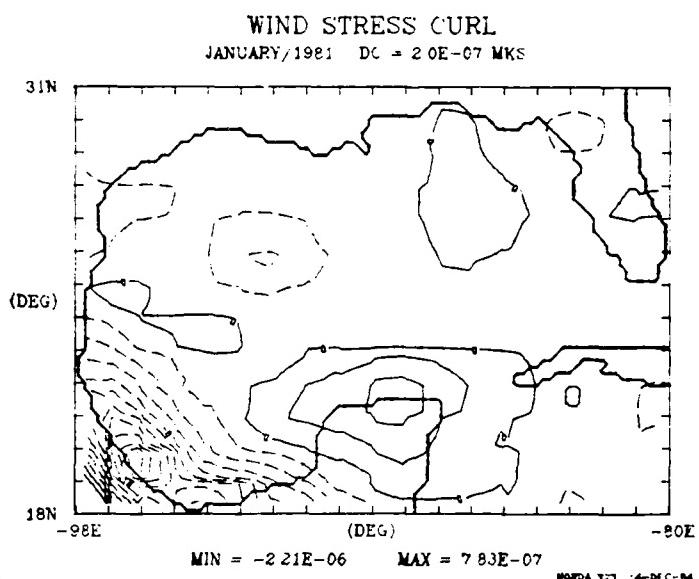
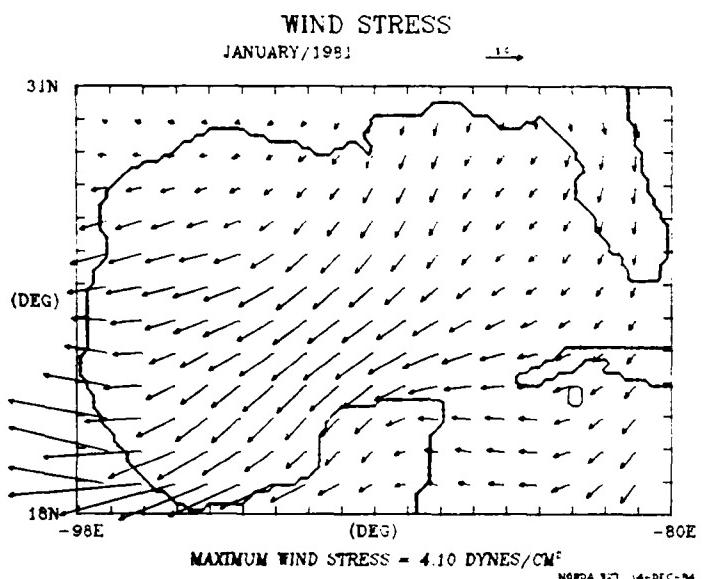
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WIND STRESS CURL
SEPTEMBER/1980 DC = 2.0E-07 MKS







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NAVY CORRECTED GEOSTROPHIC WIND SET FOR THE GULF OF
MEXICO(U) JAYCOR ALEXANDRIA VA R C RHODES ET AL.
MAR 85 NORDA-TN-318 N00014-85-R-0578

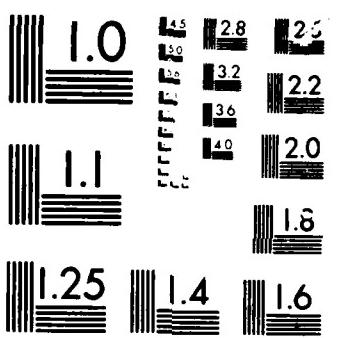
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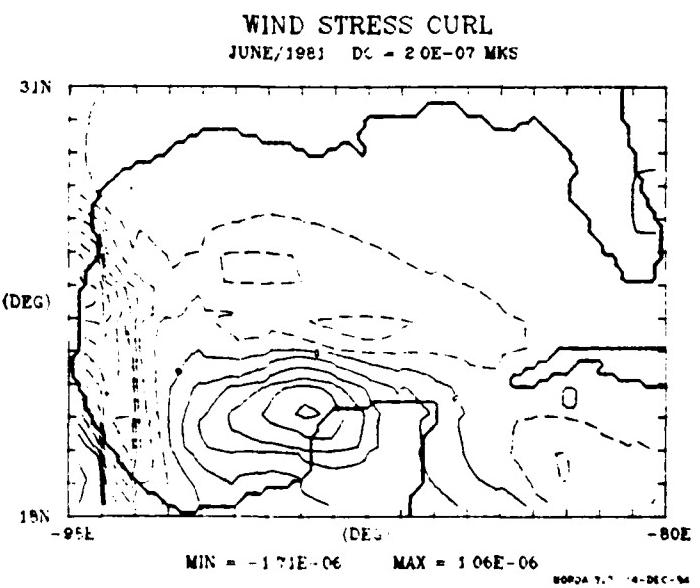
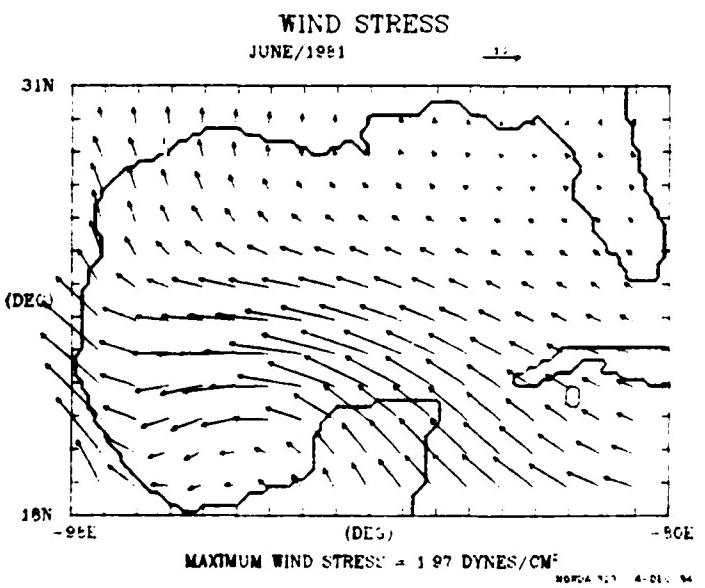
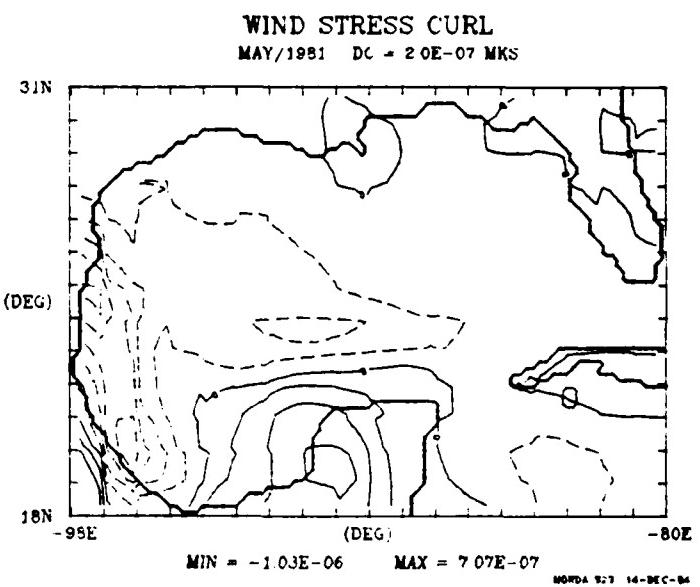
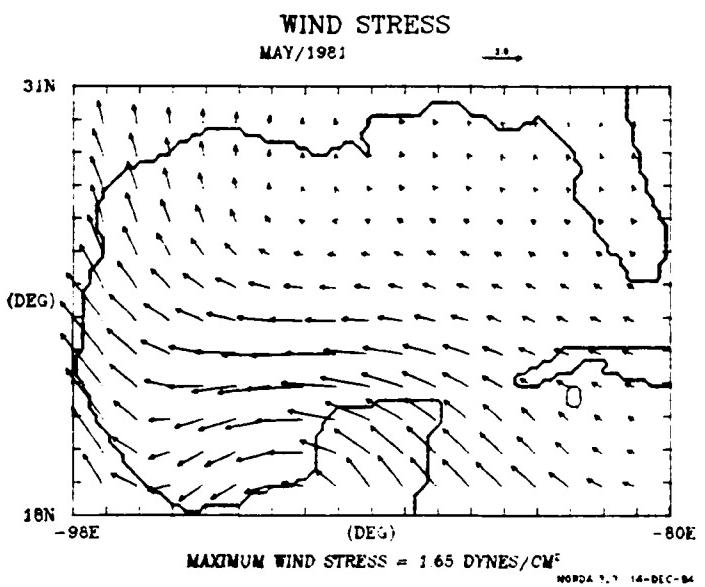
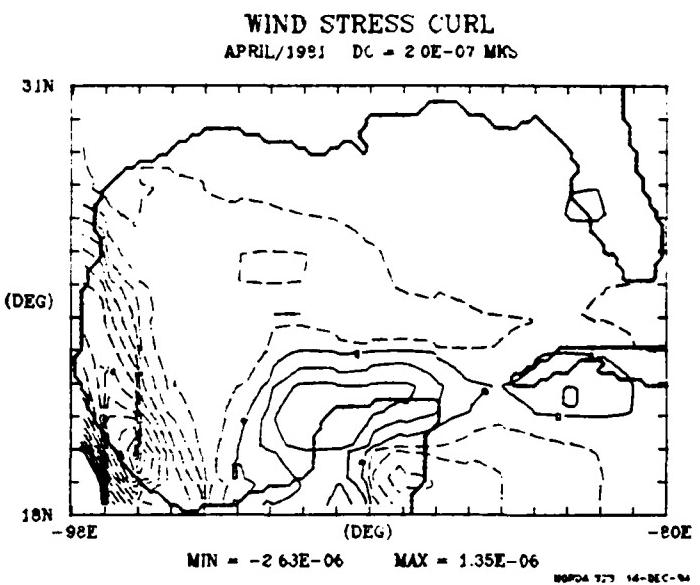
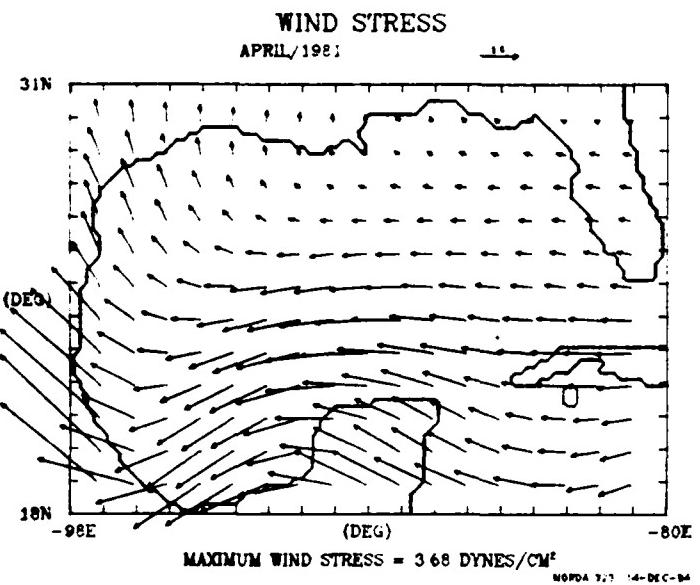
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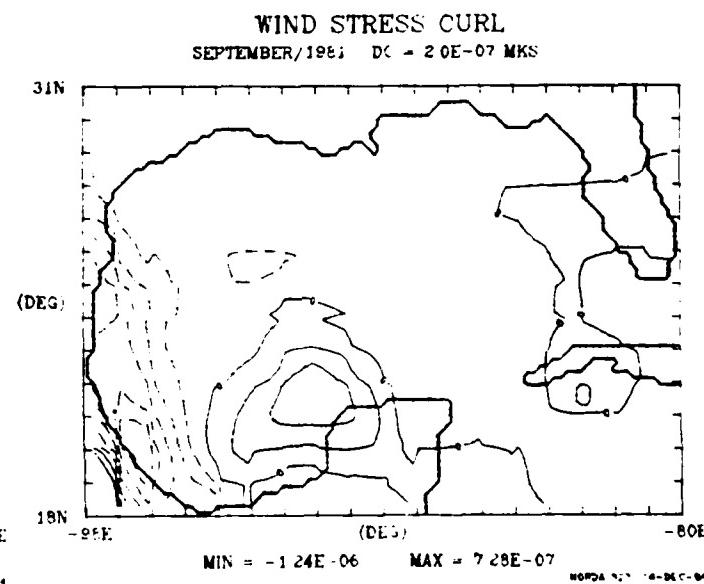
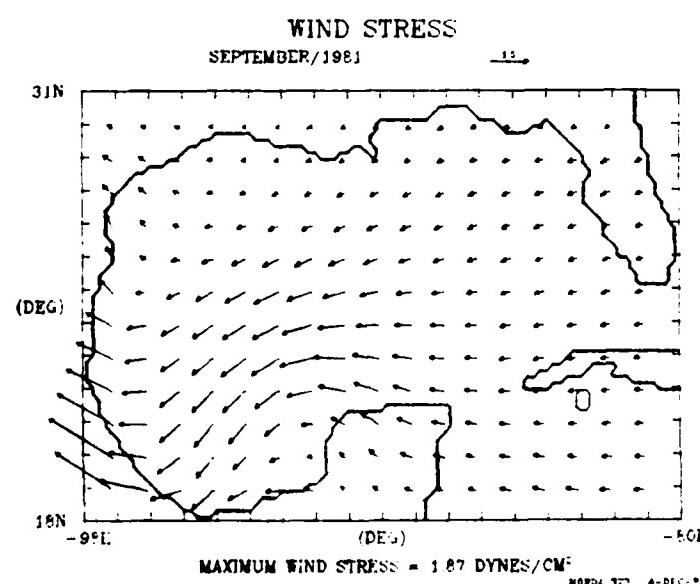
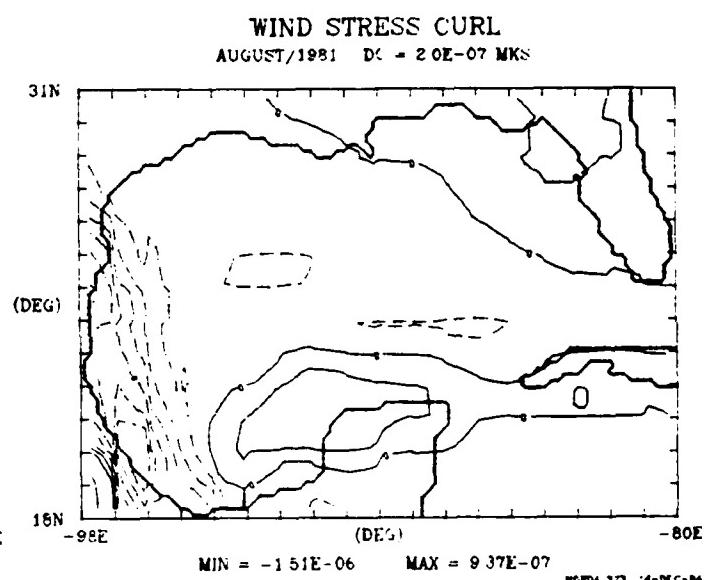
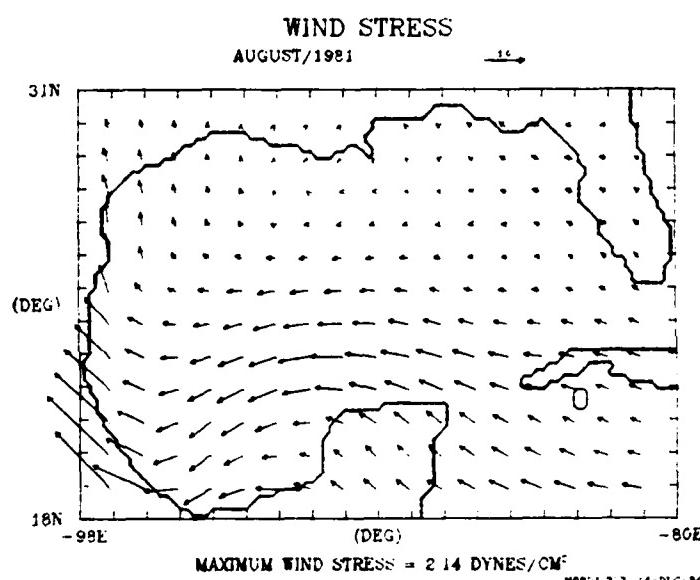
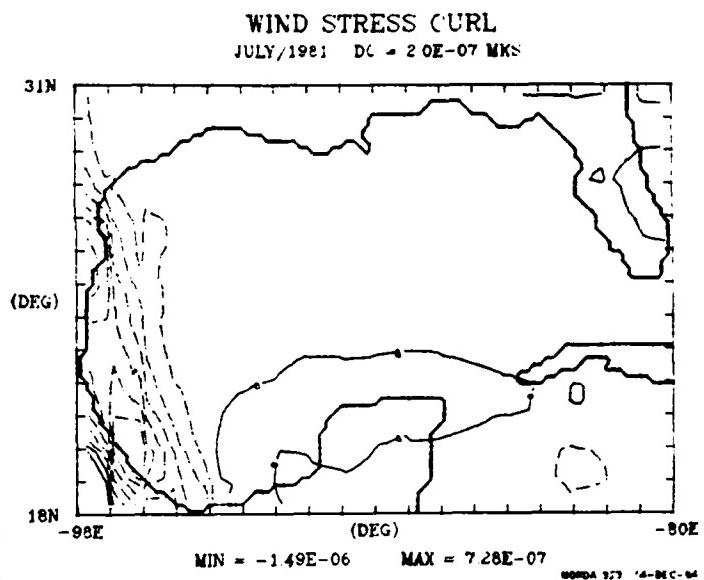
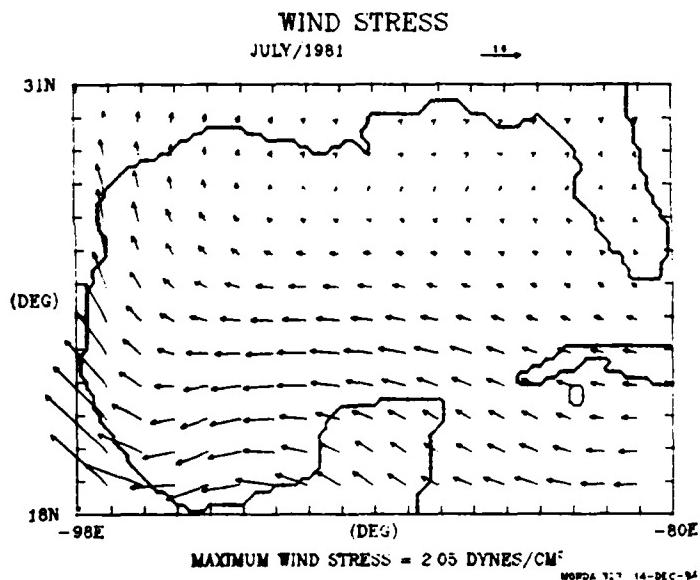
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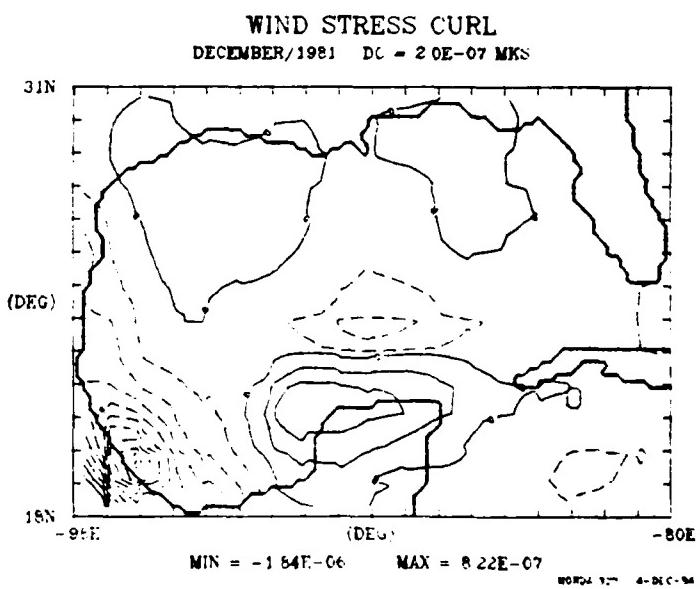
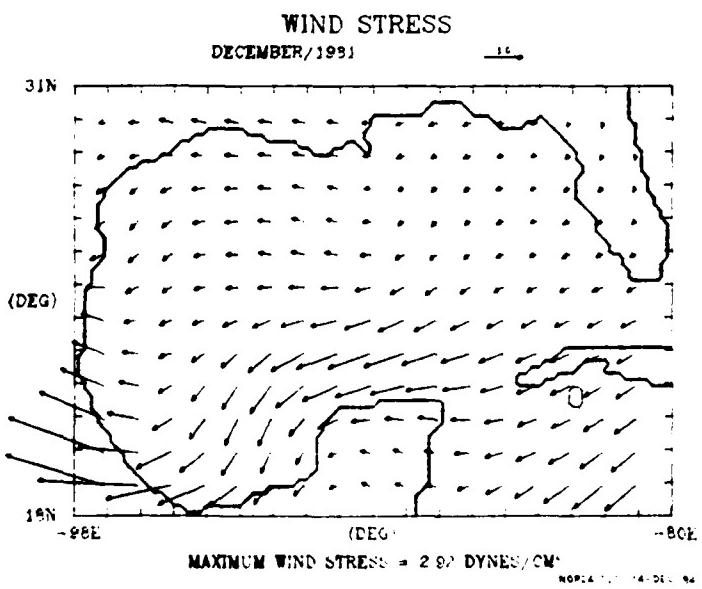
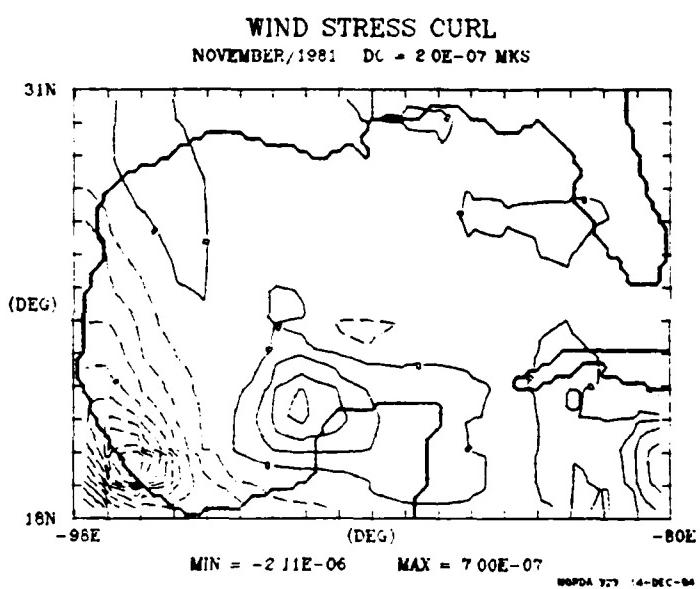
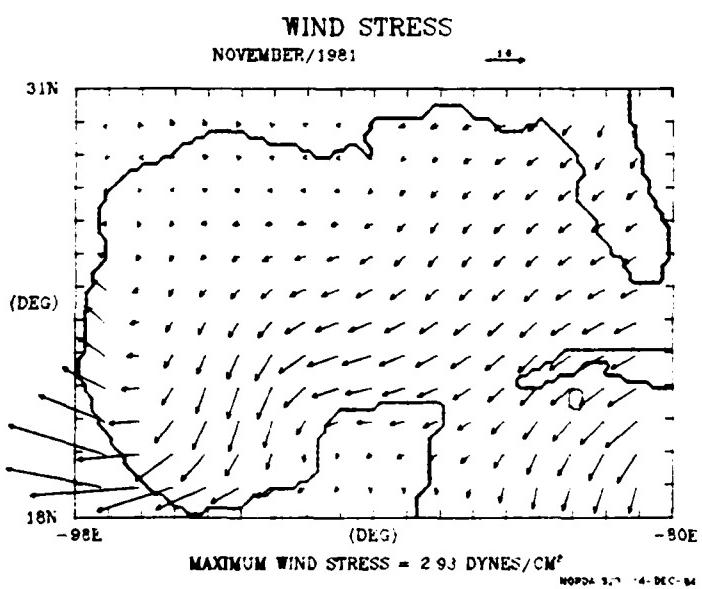
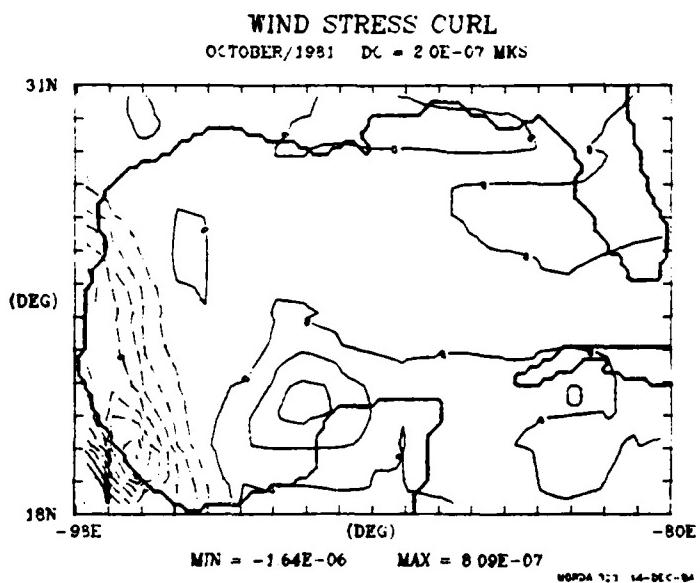
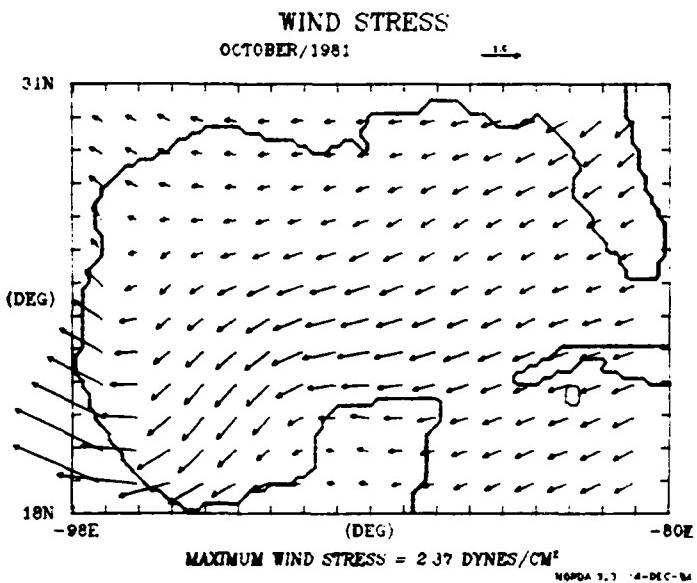
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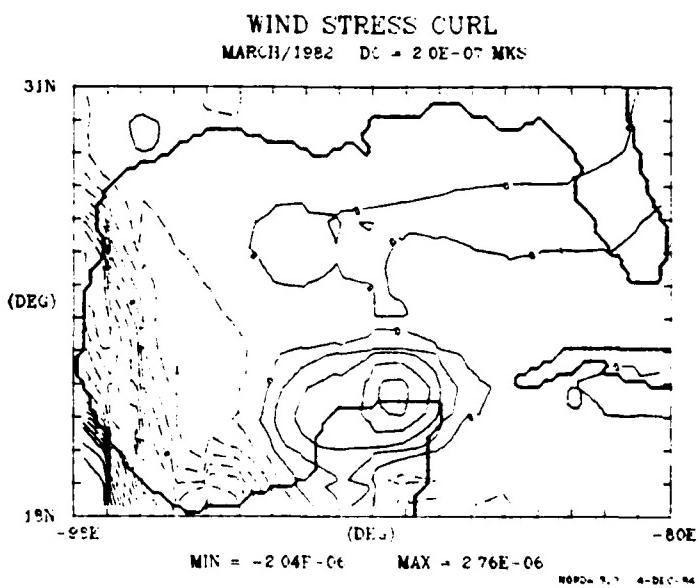
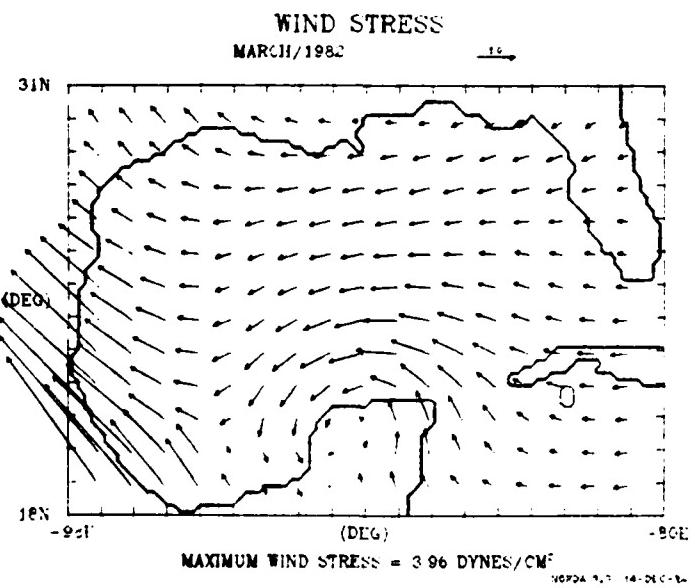
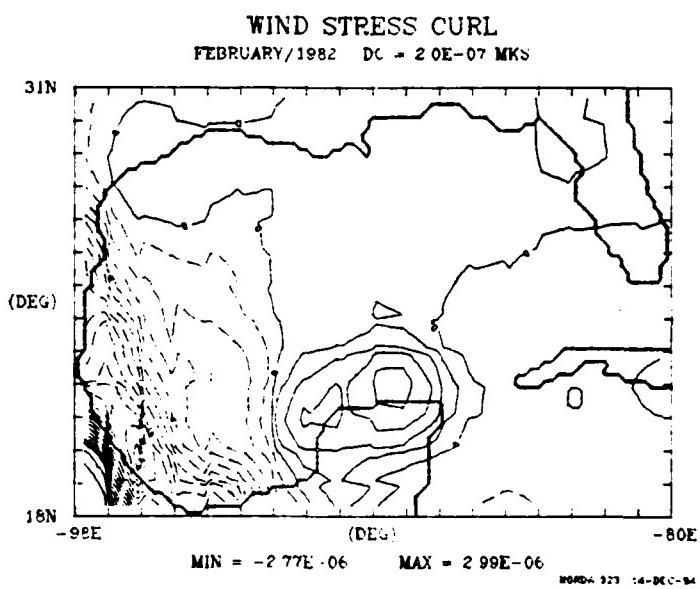
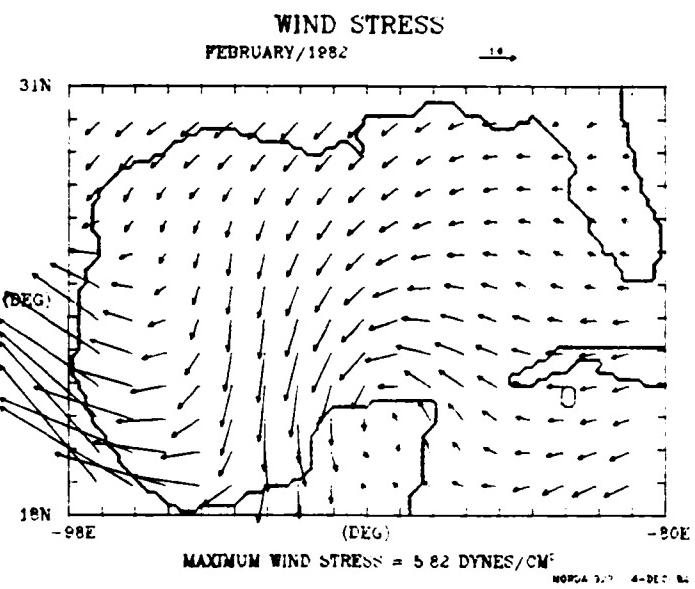
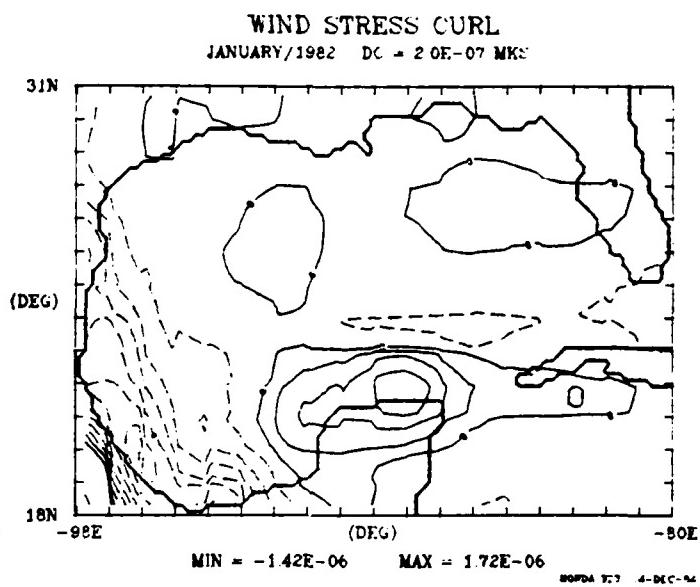
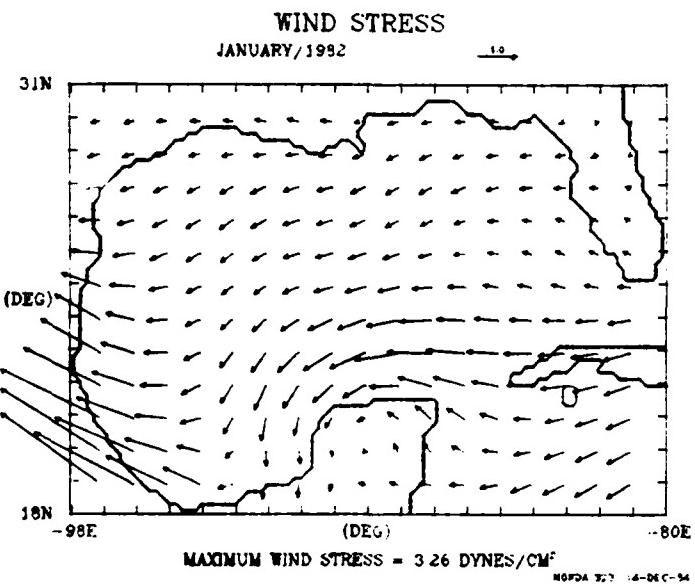


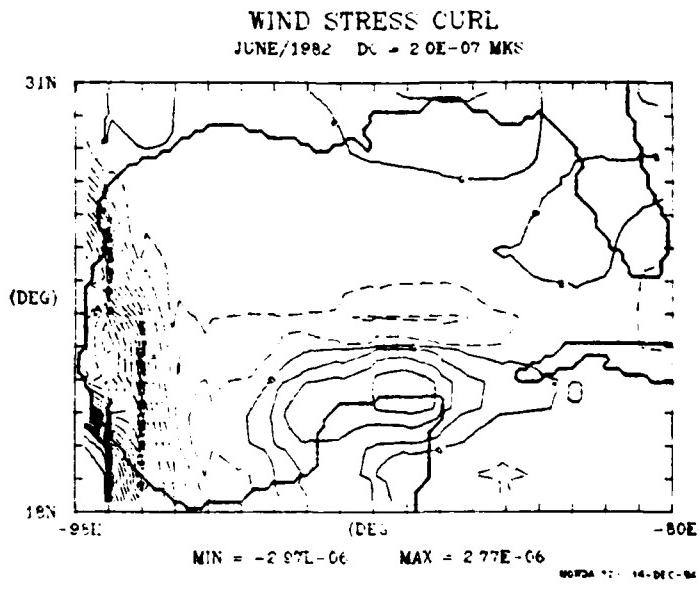
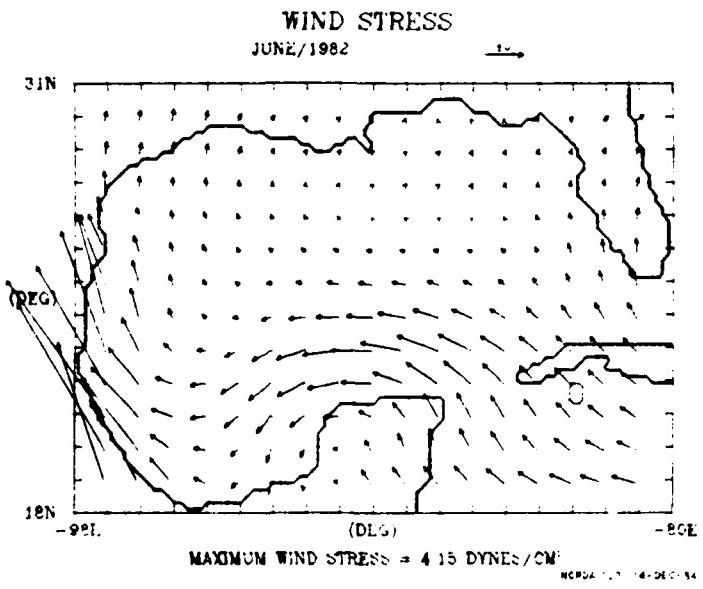
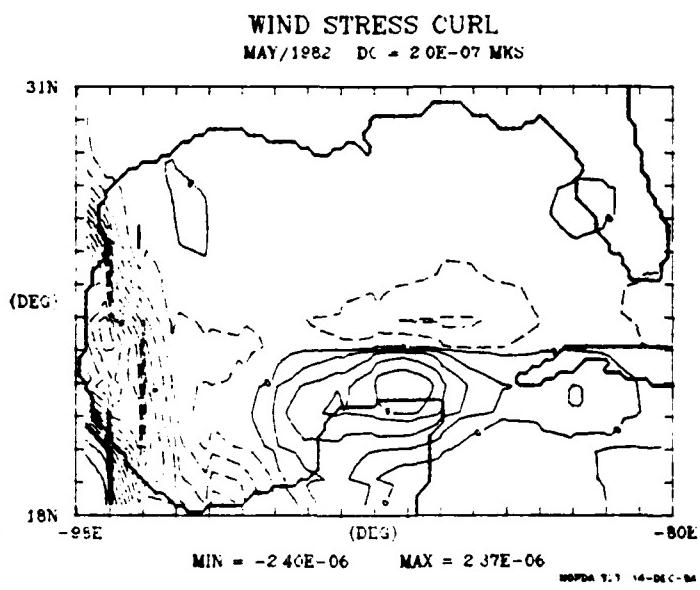
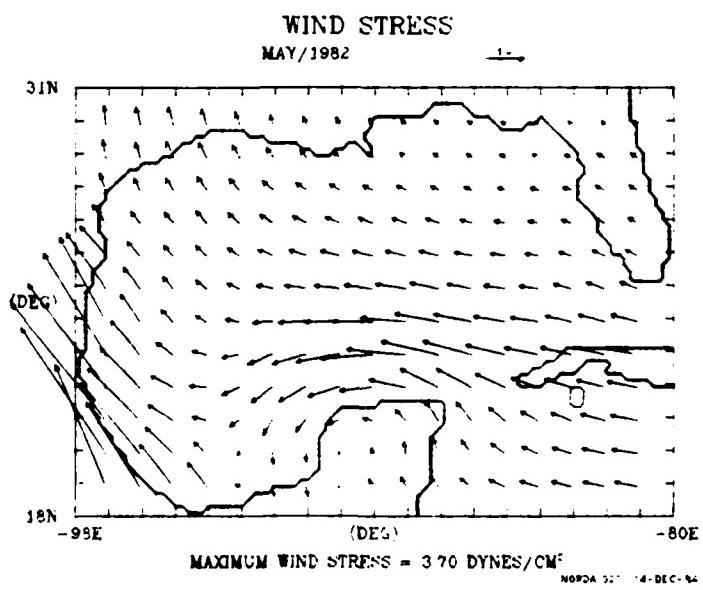
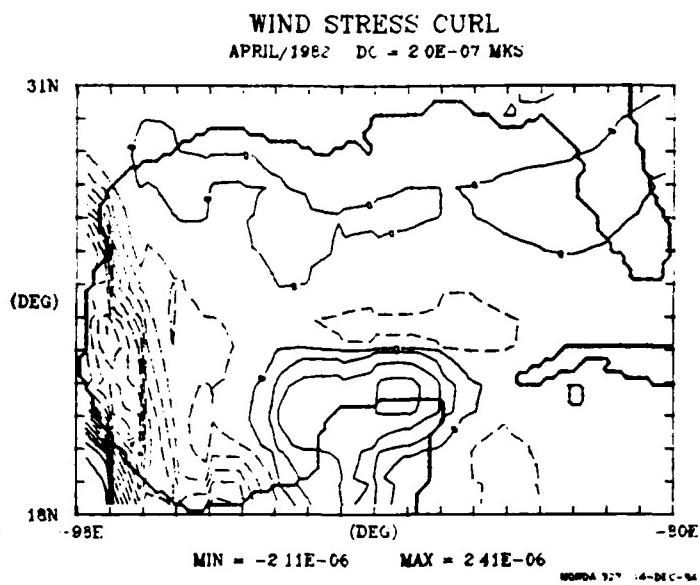
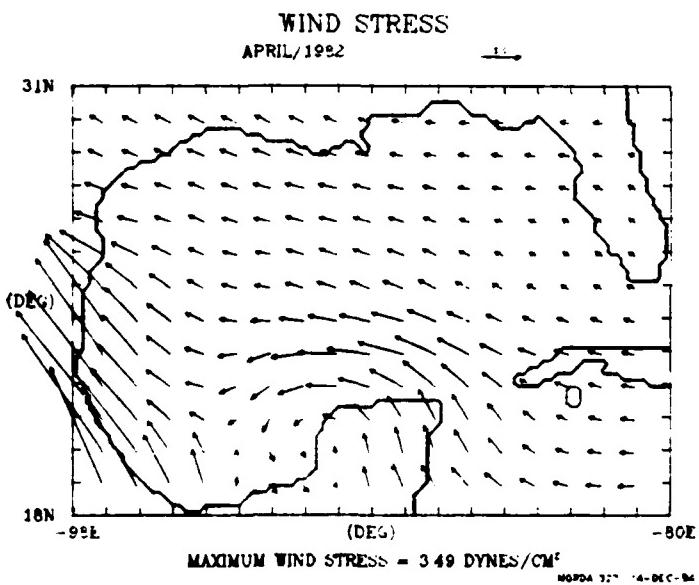




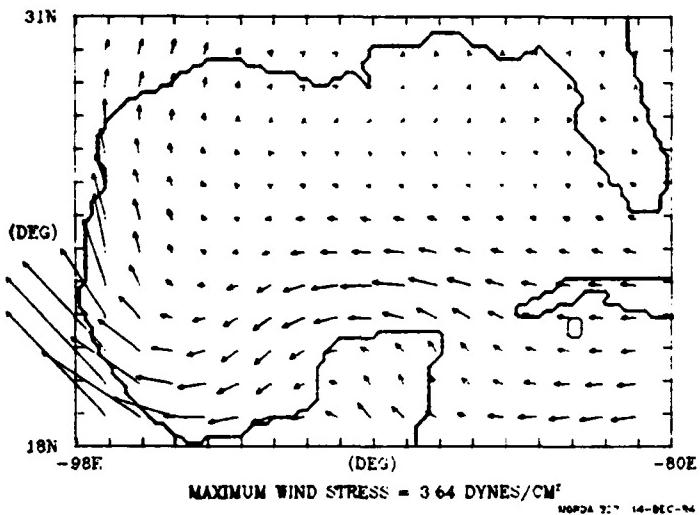




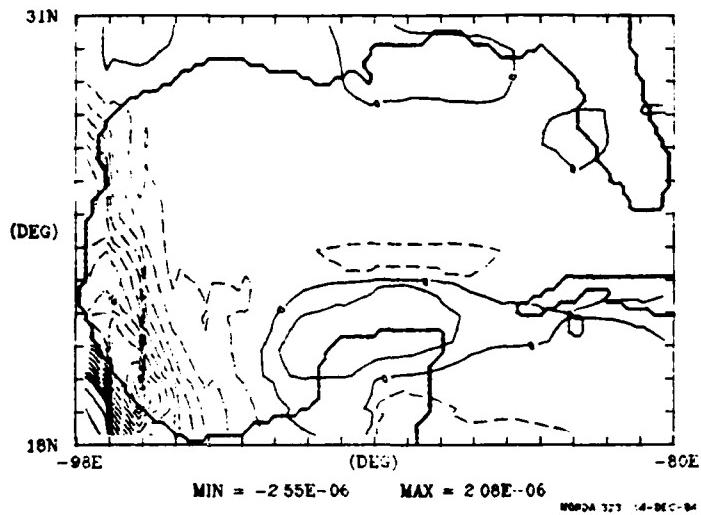




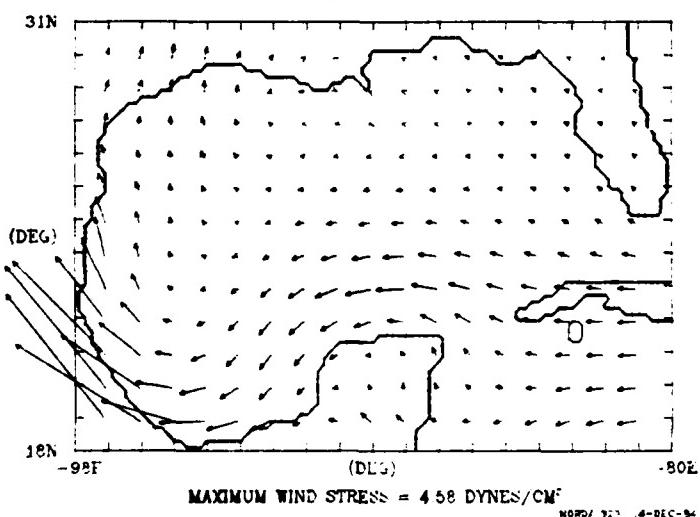
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JULY/1982



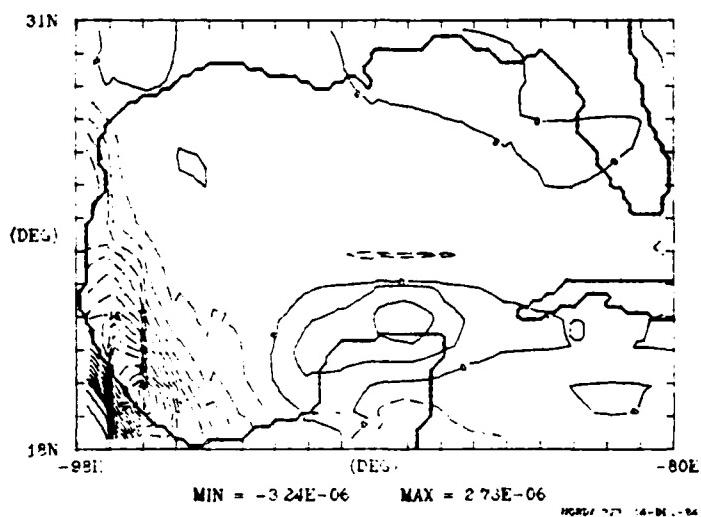
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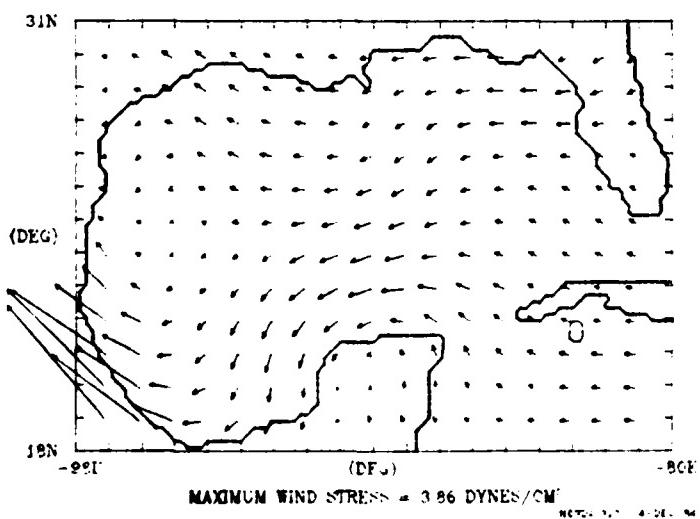
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AUGUST/1982



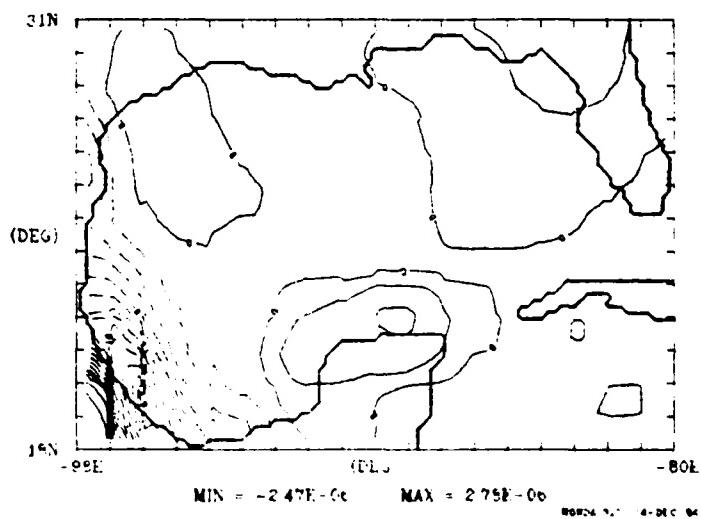
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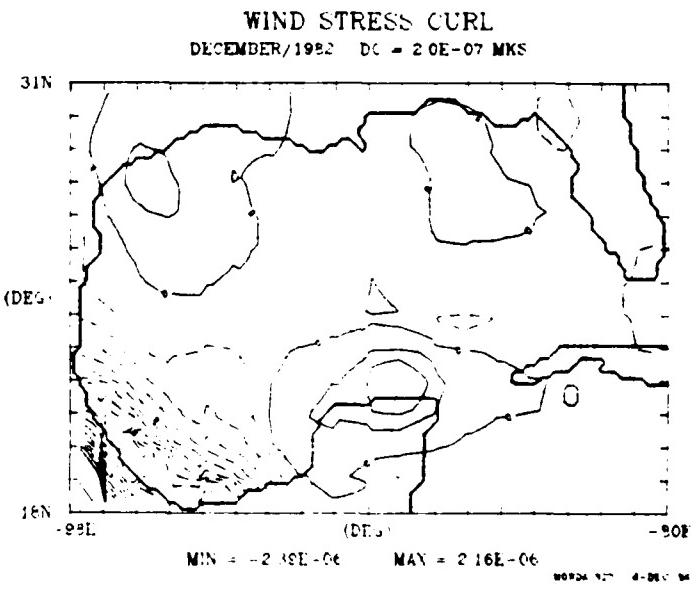
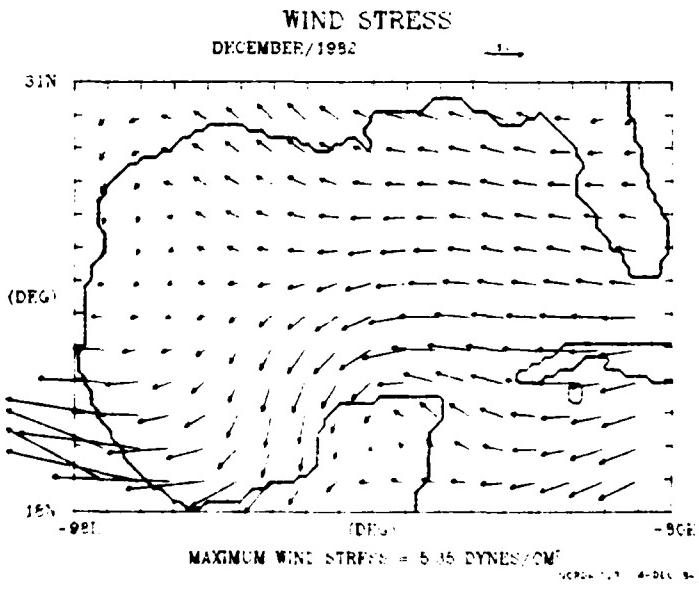
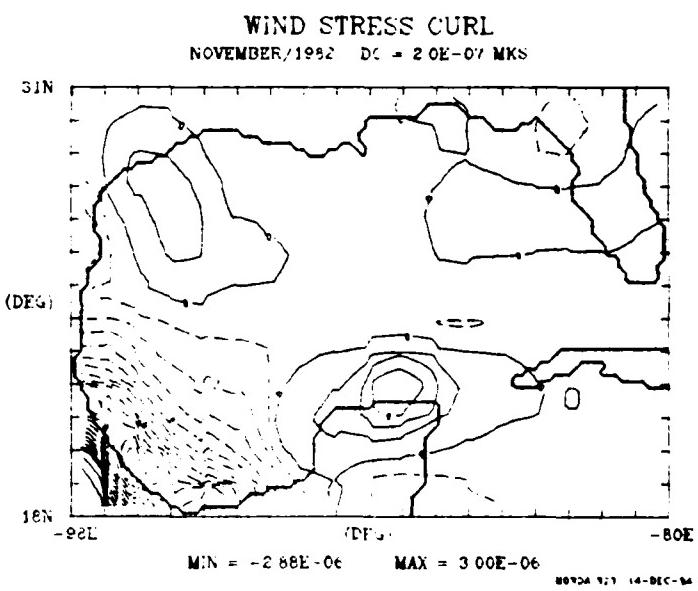
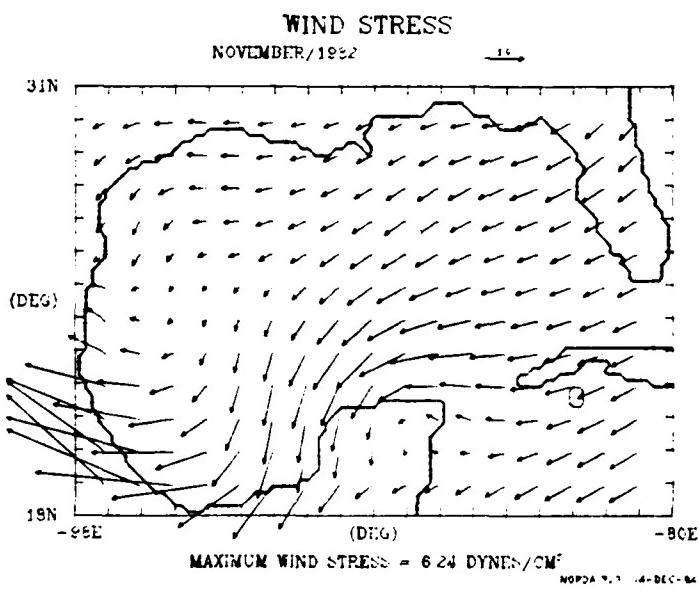
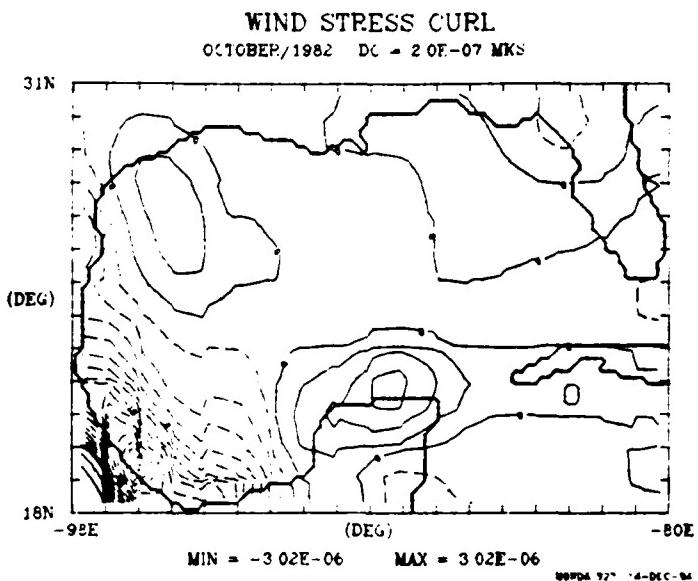
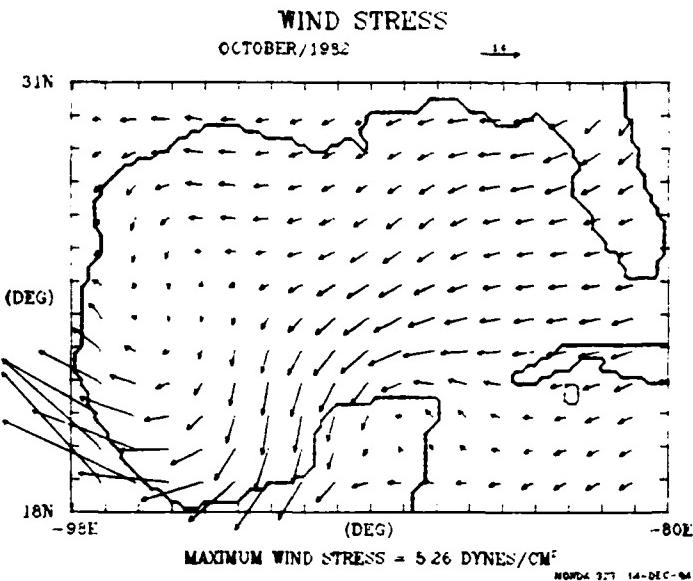


WIND STRESS
SEPTEMBER/1982



WIND STRESS CURL
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SECURITY CLASSIFICATION OF THIS PAGE

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REPORT DOCUMENTATION PAGE												
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6c ADDRESS (City, State and ZIP Code) 205 South Whiting Street Alexandria, Virginia 22304		7b ADDRESS (City, State and ZIP Code) Ocean Science Directorate NSTL, Mississippi 39529-5004										
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11 TITLE (Include Security Classification) Navy-Corrected Geostrophic Wind Set for the Gulf of Mexico												
12 PERSONAL AUTHORS R. C. Rhodes*, A. J. Wallcraft*, and J. D. Thompson**												
13a TYPE OF REPORT Final	13c TIME COVERED From _____ To _____	14 DATE OF REPORT Yr. Mo. Da. March 1985	15 PAGE COUNT 112									
16 SUPPLEMENTARY NOTATION *with JAYCOR **with NORDA		16 SUBJECT TERMS (Continue on reverse if necessary and identify by block number) Gulf of Mexico, wind fields, geostrophic wind										
17 ABSTRACT (Continue on reverse if necessary and identify by block number) The large variability of the Gulf of Mexico wind field indicates that high-resolution wind data will be required to represent the weather systems affecting ocean circulation. This report presents methods and results of the calculation of a corrected geostrophic wind data set with high temporal and spatial resolution. Corrected geostrophic wind was calculated from surface pressure analyses compiled by the Fleet Numerical Oceanography Center. The correction factors for wind magnitude and direction were calculated using linear regressions of observed Gulf buoy winds and geostrophic winds derived at the buoys. The regressions were done for each month to determine the seasonal variability of the correction factors. The magnitude correction was found to be nearly constant (0.675) throughout the year, but the direction correction varied as a sine function dependent on the time of the year.												
20 DISTRIBUTION AVAILABILITY OF ABSTRACT UNCLASSIFIED UNLIMITED		21 ABSTRACT SECURITY CLASSIFICATION Unclassified										
22 NAME OF RESPONSIBLE INDIVIDUAL J. Dana Thompson		23 TELEPHONE NUMBER (Local Area Code) (601) 688-4625		24 OFFICE SYMBOL Code 323								

The corrected geostrophic wind was calculated twice daily from 1967–1982 on a spherical grid over the Gulf, and the wind stress and wind stress curl fields were then calculated. Twelve-hourly stress and curl fields show large temporal variations of the wind field for both winter and summer months. Seasonal and monthly climatologies of the stress and corresponding curl show positive curl over the Yucatan and negative curl in the southwest Gulf, which are features not seen in any previous study of Gulf wind stress.

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